L ODOM TELLS HOW... Series begins this issue

SKYWAYS

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IPPER

Pilot's Report... Cub Clipper

☆

Stop, Look, & Relax

JULY 1949 25¢

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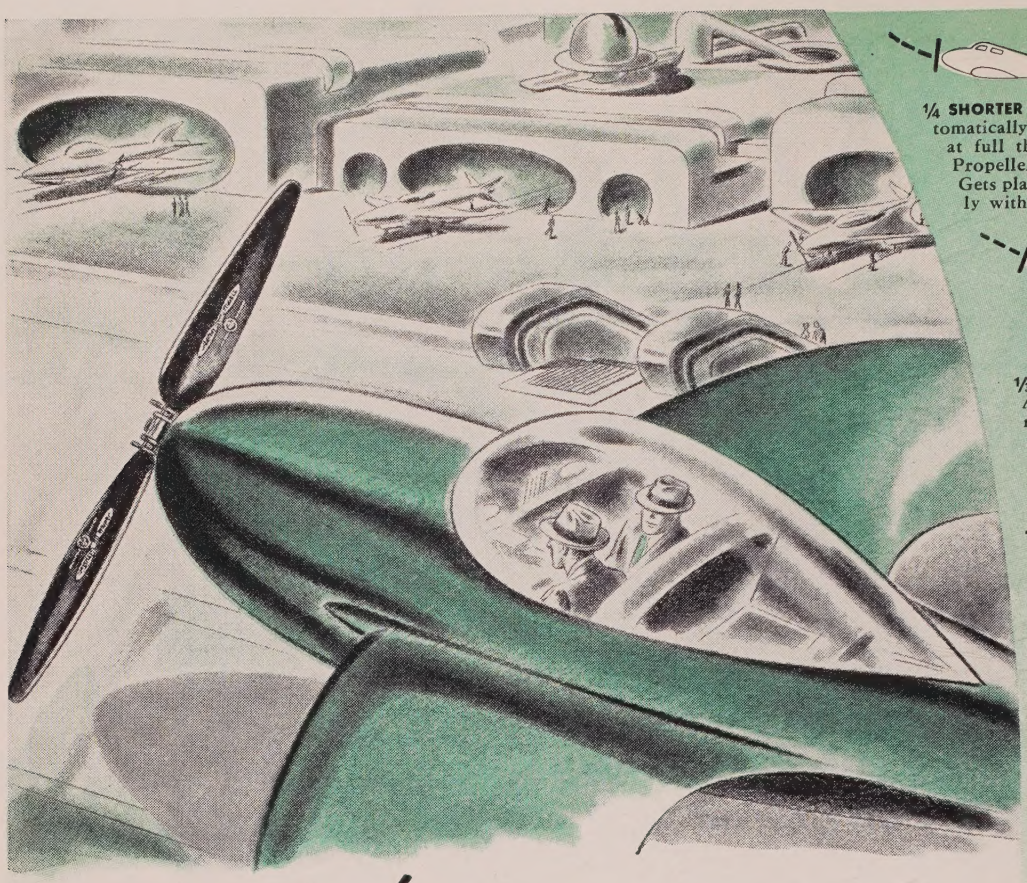
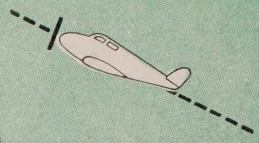
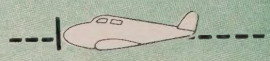


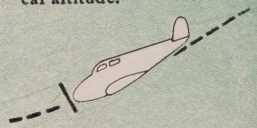
¼ SHORTER TAKE-OFF: Automatically, with the engine at full throttle, Aeromatic Propeller assumes low pitch. Gets plane off ground quickly with full take-off power.



⅓ HIGHER RATE OF CLIMB: Automatically responds to natural forces. Increases pitch as air speed rises. Gets plane to cruising level fast, on minimum fuel.



GREATER CRUISING RANGE AND SPEED: Automatically maintains the best pitch for top cruising on minimum fuel at any level up to critical altitude.



SAFER LANDINGS: Automatically adjusts its pitch for a long, flat glide. Moves to low pitch instantly for a quick pickup if pilot overshoots the field.

Tomorrow's SPEED..SAFETY..ECONOMY are available *Today* ...with an AEROMATIC® propeller

YOU can get tomorrow's speed, safety and economy *today* for your plane with an Aeromatic automatic Variable-Pitch Propeller. That's because this propeller *automatically* picks the proper propeller bite for any load, angle of climb, or cruising speed. Gives you ¼ shorter take-off runs, faster climbing to critical* altitude, better landing control . . . with lower fuel consumption!

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For a description of how Aeromatic will add exceptional performance to your plane, see the illustrations here—but for the full facts, write today for your copy of the *free* Aeromatic booklet. Address: Koppers Co., Inc., Aeromatic Propeller Dept., 257 Scott Street, Baltimore 3, Maryland.

*For peak performance of aircraft with higher cruising altitudes, Aeromatic Propellers can be equipped with special Aeromatic Altitude Control.

TYPICAL COMMENT

"Have made some heavily loaded take-offs from high fields—Aeromatic contributed greatly to T.O. and climb performance of the Cruiser. My opinion: AEROMATIC is a considerable safety factor in carrying loads over mountains!"

Wayne Brown,
Denver, Colo.

Aeromatic

The propeller with a brain KOPPERS *for your personal plane*

Air-Controlled Automatic Propeller—Licensed under Patents of Everel Propeller Corp.

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Also available for numerous foreign models

Honolulu non-stop to Teterboro, N. J. Official Great Circle distance of 4,957.24 miles; actual distance, 5,273 miles. Average miles per gallon, 19.37. Average ground speed, 146.3 miles per hour.

When the chips are down

Not many people want to sit in one place for 36 hours; let alone try to fly an airplane continuously for that period, through darkness, snowstorms, thunderstorms, and icing conditions, as well as fair weather.

But Captain Bill Odom's demonstration of a BEECHCRAFT Bonanza from Honolulu to Teterboro non-stop (5,273 miles) is a worthwhile addition to the pride of ownership of all Bonanza owners.

The ocean flight, beginning at 3,858 pounds gross weight, through instrument conditions; the passage through thunderstorms, icing conditions, and snowstorms over the western ranges of the United States; and the amazing economy of 19.37 miles per gallon of gasoline, and 3,500 miles per gallon of oil; all prove that the BEECHCRAFT Bonanza has what it takes "When the Chips are Down."

All Bonanza owners can take added pride in their choice of a personal airplane from this legendary exploit.

Apply Bonanza Transportation to your business

Company ownership of this fast, *quiet* plane turns travel days into travel *hours* — time saved you can put to *profitable* use. Investigate! A note on your company letterhead will bring an informative 60-page brochure on "The Air Fleet of American Business." Write today to Beech Aircraft Corp., Wichita, Kansas.

Top speed, 184 mph
Cruising speed 170 mph
Range, 750 miles

Beechcraft
BONANZA
MODEL A35

BEECHCRAFTS ARE THE AIR FLEET OF AMERICAN BUSINESS

Memo from

AIRPORT DEPARTMENT
PRATT & WHITNEY AIRCRAFT

To: Executive aircraft operators

Private plane owners

Fleet operators

The AIRPORT DEPARTMENT of Pratt & Whitney Aircraft, with its extensive facilities, is available to all operators of Pratt & Whitney engines and Hamilton Standard propellers. Repair and overhaul service is as excellent in method and personnel as that of the original factory production.

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SKYWAYS

Cover: Piper Clipper — Smith-Coda

Is It Safe to Fly? ..... James W. Batchelor 15
Record proves personal flying safe and getting safer

Pilot's Report: Cub Clipper ..... Don Downie 16
New four-placer is high in performance, low in cost

Bombs for the '36 19
USAF's mammoth B-36 hauls bomb load of 84,000 pounds

Every Pilot's VHF ..... Harry Graybill 20
Narco Omni-Range proves itself to a new-to-radio pilot

Jet Mascot 22
"Jet," the cocker spaniel rides jet, the airplane

Cross-Country is Easy ..... Capt. Bill Odom 24
Famed long-range flyer offers tips on flying X-C

They Called It War ..... J. Davis Scott 26
The Airlift boys take a civilian passenger . . . and show him

Big Wind Factory ..... Chase Crawford 29
If you're heading West, watch out for those mountain winds

Announcing . . . Helioplane 31
Revolutionary lightplane features safe low speed of 27 mph

Stop, Look and Relax ..... Neil Fulton 32
Practice emergency procedures and be ready to use them

Air Service Plus 34
Clover Leaf Field proves there's a reason for its popularity

Dilbert ..... Robt. Osborn and Seth Warner 37
He who sits with his neck in sits with his neck out

Operational Engineering ..... Jerry Leichter 38
Maintenance and lubrication cues for Ryan Navion

Air Your Views 6
USAF News 8
Naval Aviation 10
Prop Wash 12
CAOA News 40
CAP News 42

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AIR YOUR VIEWS

One and the Same . . .

Gentlemen:

While browsing through an old issue of SKYWAYS (May, 1947), I came across the name of Ed Owen, then a test pilot for Chance Vought.

Could this be the same Ed Owen who was skipper of "Fighting Five" aboard the *Yorktown* in 1942-44, and who is referred to in Jensen's "Carrier War?"

C. F. RAMEY

Oxford, Ohio

Right you are, Mr. Ramey. Ed Owen is now with Curtiss-Wright Corporation, Propeller Division, Caldwell, N. J., working on special electronic devices for C-W. Ed Owen is a very popular member of the Curtiss-Wright family. He spent some time touring the country giving talks before civic and engineering groups. Try writing him at C-W's plant located at Caldwell, N. J.—ED.

Bearcat vs. Mustang

Gentlemen:

In looking over February SKYWAYS, I noted the cover showing Al Williams and his new F8F *Bearcat.* Since he procured this fighter (how?), he has been giving out with little bits of information on it through the Gulf ad.

He says his F8F is the fastest prop-driven plane in the world. Well, I'll either argue with him or prove to him he's wrong . . . or else my airspeed indicator was wrong and the North American Aviation people are a bunch of story tellers. I would like to wager with him or anyone else that the P-51H (now F-51H) was the fastest prop-driven plane, bar none.

I had an F-51H doing 460 mph straight and level, true airspeed, and the factory says they can do even a little better than that. I'll grant the F8F can shoot to altitude quick as a flash and is darned fast, but for the sake of too much discussion, I think the F-51H will go a shade faster.

Anyway . . . best of luck to Williams who is a good pilot, one who is old and bold.

BEN L. BROWN

Cincinnati, Ohio

The "how" of your question, Mr. Brown, isn't easy. But . . . this is the way we heard it. It seems that the purchase of the F8F by Gulf was via the Navy. Al Williams worked with both Naval Aviation and the Air Force during the war, and so the F8F was not an "un-flown by Williams" airplane. Perhaps by way of "Thank you for services rendered," the Navy permitted Gulf to purchase the Bearcat. *The ship did not include any of the instruments or equipment considered restricted or classified by either the Navy or the Air Force. As to which is the faster, we don't want to get into that argument. But here's what we've heard: The* Bearcat *has faster rate of climb and is faster at higher altitudes than the F-51H. According to the performance specs, the F-51H would win the race at (488 mph) at 25,000 feet . . . and the F8F would win it at (455 mph) 42,000 feet. In our book both of those airplanes are excellent and pilots who've flown them have every right to boast of their performance, just as you have done.*—ED.

Subsidy?

Gentlemen:

Judging by what you publish, one would tend to think that your magazine is subsidized by the Navy as a promotional scheme.

NEB

Chicago, Illinois

Nope . . . no subsidy . . . any more than the Air Force subsidized the March issue . . . or private flying the April issue. Our readers have requested these special issues and so we put them together, once a year, to supply our readers with the information they ask for. That's all.—ED.

PB4Y?

Gentlemen:

I noticed in your May issue an article on guided missiles. On the second page of the article there is a picture of a so-called "PB4Y," carrying a guided missile under its right wing. The fact is that airplane is not a "PB4Y" but it is a "B-24," commonly called *Liberator.*

B. RADELAT

New Orleans, La.

Thanks for your letter, Mr. Radelat. "PB4Y" is the Navy's designation for the Air Force's B-24; both are called Liberator.—ED.

TBF's?

Gentlemen:

I am only 13 years old and I don't know too much about planes, but I think those planes in "Weekend Workout" were TBF-1's, not TBM's. They are *Avengers.*

BOBBY GITTINGS

Elmwood Park, Illinois

We're both right, Bobby. TBF's and TBM's are Avengers. *The TBF's were built by Grumman; and the TBM's were built to same design by General Motors Eastern Division in New Jersey. The planes flown by the NAR's in "Weekend Workout" were* Avengers *that came off the General Motors Eastern Division's assembly line . . . and so were designated TBM.*—ED.

Commercial Tix

Gentlemen:

I'd like to become a commercial pilot, but since I am a Japanese-American citizen, I'm worried. Can I get a commercial license?

J. DAIRIKI

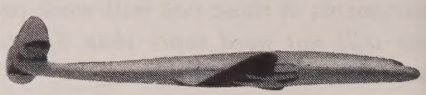
Sacramento, Calif.

In order for you to be given a commercial pilot's license, a reciprocal treaty must exist between this country and Japan. In other words, if Japan awards Commercial licenses to U. S. citizens in Japan, then the U. S. would grant such licenses to Japanese here in the U. S. Such a treaty does not now exist between Japan and the U. S. Therefore, as long as this condition continues you could not get a commercial ticket. Might we suggest, however, that you write to the Civil Aeronautics Board in Washington.—ED.

Lockheed Constellation

INTERCONTINENTAL LEADER

~across the Atlantic 3 to 1~



The famed Lockheed Constellation is by far the most popular intercontinental transport flying the Atlantic. The Constellation carries *three times as many passengers, month in and month out, as all other transports combined.* It has been tried and proven by 4000 million passenger miles of dependable service on every continent of the world.

Lockheed

LOOK TO LOCKHEED FOR LEADERSHIP

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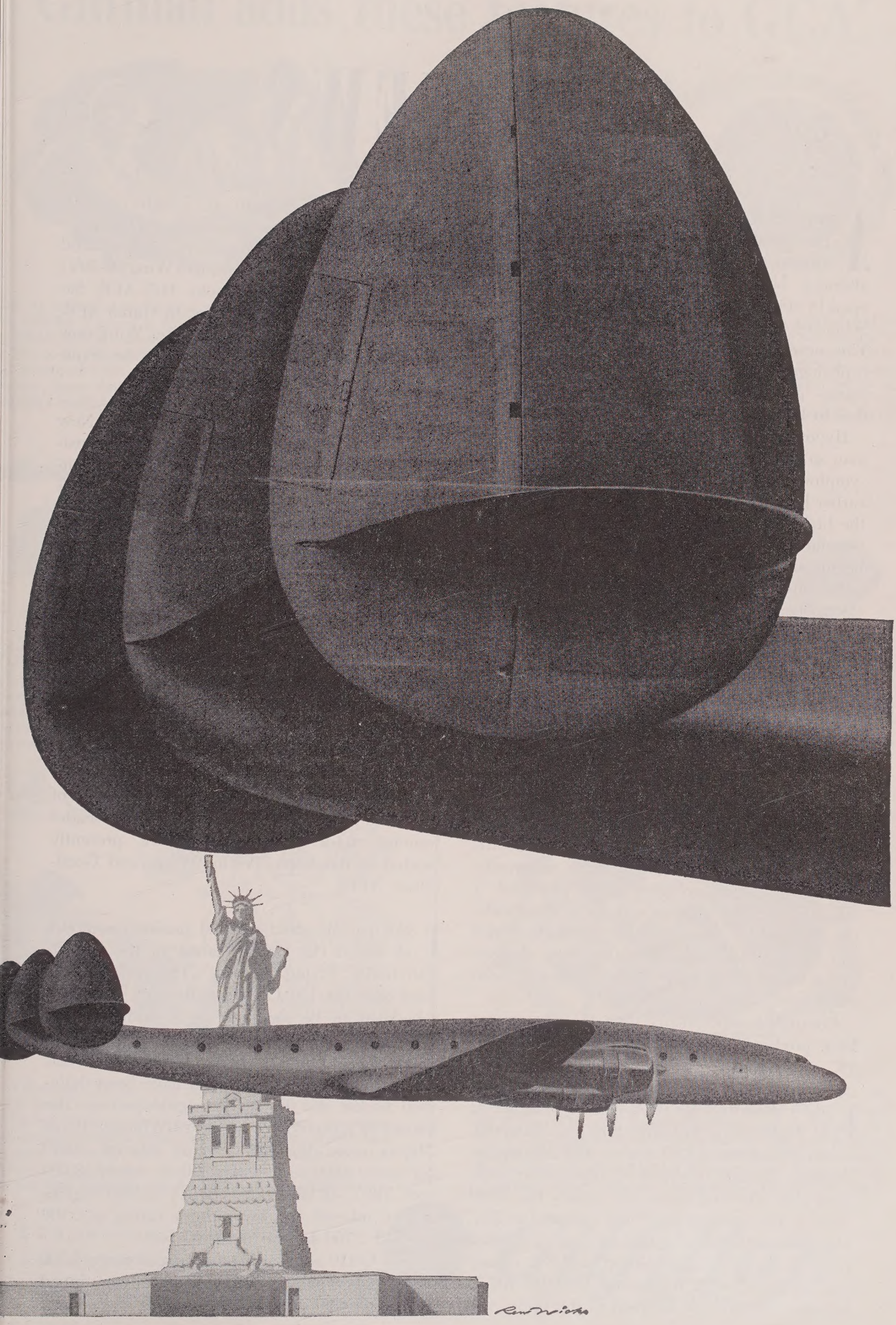


USAF NEWS

A NEW device that promises greater safety for airmen flying at high altitudes has been developed by scientists at USAF's School of Aviation Medicine. This new development, a miniature electroencephalograph, keeps tabs on a flyer's "brainwaves" and warns him of impending blackout due to lack of oxygen, also known as hypoxia.

Hypoxia effects, which sneak up on an airman so rapidly that he often is unaware of his symptoms until too late, can be detected much earlier by the new device. Like all living tissue, the brain produces minute electrical pulsations, popularly called "brainwaves." When hypoxia begins, characteristic changes take place in the pulsations which can be recognized by the electroencephalograph equipment, pre-set for hypoxia-symptoms. At an altitude of 25,000 feet, quite common for planes of today, the time between the onset of hypoxia and the moment when blackout occurs (or as USAF neurologists call it, "the time of useful consciousness") is 270 seconds. The electroencephalograph can give warning within 100 seconds of the beginning of oxygen-lack allowing the airman almost three minutes of safety time.

Although standard electroencephalograph equipment is much too bulky for use in aircraft, the School of Aviation Medicine's electronics engineers and neurologists have produced a miniature version, light enough to be worn without discomfort during flight. Head-electrodes can be built into helmets and outlets plugged into a warning box in the same manner as radio earphones.

Controlled experiments with this equipment have produced successful results on 105 out of 107 men tested.

USAF's Fourth Fighter Wing, now stationed at Andrews AFB, Camp Springs, Maryland, is being transferred to Langley AFB, Hampton, Virginia. The unit, which is equipped with Lockheed F-80 *Shooting Stars,* will replace the 363rd Tactical Reconnaissance Wing, now at Langley. The 363rd will be inactivated although the 363rd Tactical Reconnaissance Group, and two squadrons equipped with RF-80 and Douglas RB-26 *Invader* aircraft, now assigned to the Wing, will remain at Langley. USAF has also announced the forthcoming move of the 22nd Bombardment Wing (B-29's) from Smoky Hill AFB, Salina, Kansas, to March AFB, Riverside, California. The 1st Fighter Wing now at March will remain there but will be transferred to Strategic Air Command.

AIR National Guard units in Wisconsin, New Mexico, and Kansas will soon get approximately 25 per cent of the Republic F-84 *Thunderjet* fighters now in use by Regular USAF squadrons. The three ANG squadrons to receive the jet fighters are the 126th Fighter Squadron at Milwaukee, the 188th Fighter Squadron at Albuquerque, and the 127th Fighter Squadron at Wichita. Other Air National Guard fighter units will be re-equipped with jet fighter units as rapidly as production schedules permit.

THE Aviation Cadet multi-engine training unit now located at Barksdale Air Force Base, Shreveport, Louisiana, will move to Lubbock Air Force Base in Texas with operations scheduled to begin there in November. The re-opening of Lubbock will bring up to five the number of Air Force bases in Texas used for aviatian cadet training. Basic training units are presently located at Randolph, Perrin, Waco, and Goodfellow AFBs.

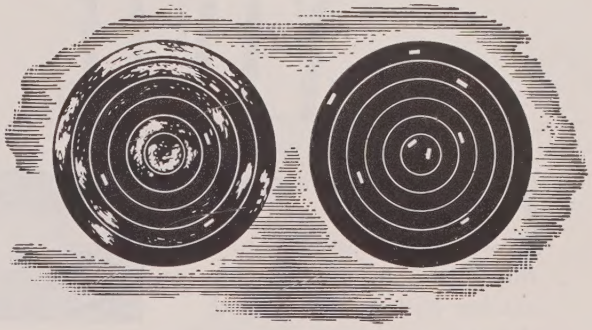
USAF has accepted the first production model of the C-119 *Packet,* latest in the line of Fairchild's "Flying Boxcars." The present contract calls for 136 C-119's with early deliveries scheduled to be made to the Continental Air Command.

Principal difference between the C-119 and Fairchild's C-82, 220 of which have been delivered to the Air Force, is engine power. The former is powered by two Pratt-Whitney *Wasp Majors* rated for 3,250 hp at take-off, 2,650 hp up to 6,000 feet, and 2,300 hp up to 18,000 feet. The C-82 has Pratt-Whitney R-2800 engines with a take-off and low-altitude rating of 2,100 hp and 1,700 hp up to 16,000 feet.

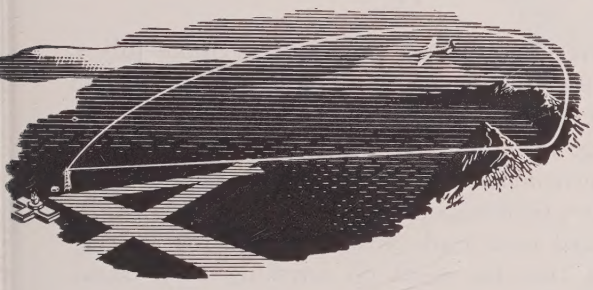
The C-119 can carry nine tons of cargo 2,000 miles. It is capable of carrying 42 fully-equipped troops plus 20 paracans of supplies.

Gilfillan adds these features to GCA*

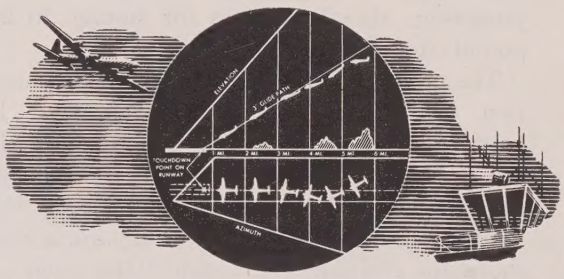
CA. As original manufacturer of the GCA radar landing sys-n, Gilfillan is proud to have pioneered its development for USAF. Under research and production contracts from the Force, US Navy and CAA, Gilfillan has greatly simplified d improved GCA as a fail-safe aid to military and civil ation. Some developments by Gilfillan are acclaimed by erica's leading electronic scientists as equal to GCA itself.



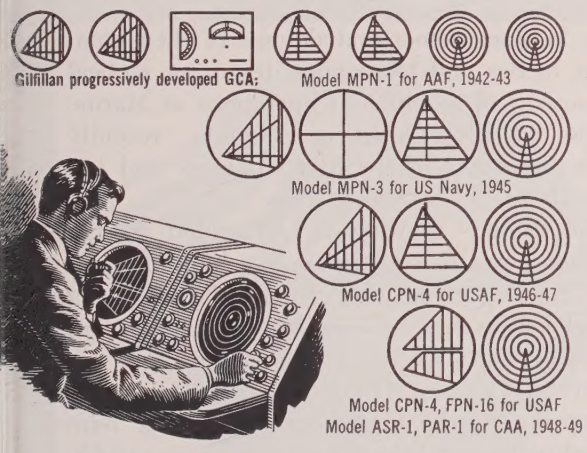
MTI. Top Gilfillan contribution to GCA is the addition of Moving Target Indicator. As GCA penetrates zero-zero weather to record *all* targets, MTI penetrates and wipes out ground clutter from the scope to show only *moving* targets. GCA no longer requires the tedious concentration of a special operator. Exact position of every aircraft is seen instantly, easily. Gilfillan was first to produce reliable, drift-free, range-selectable MTI.



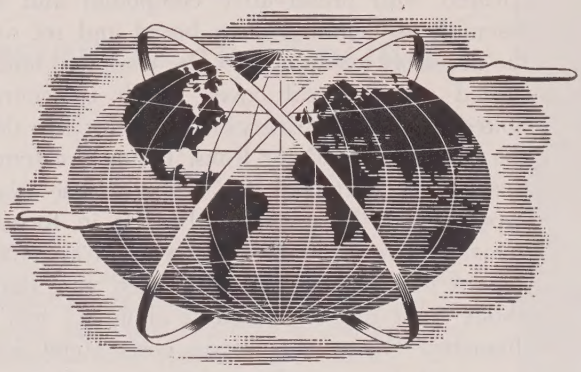
gh-powered Search. Early GCA scopes were limited to a lid" surveillance area 18 miles out and 4000 feet up. With h-speed modern aircraft, this area was inadequate. Gilfillan proved the search system to extend solid surveillance to an tude of 10,000 feet over a 30 mile radius. Now aircraft n to the extremities of the surveillance area are clearly and urately seen. Gilfillan keeps GCA paced to today's needs.



Azel Scope. Clear, exact position of aircraft appears constantly in three dimensions on the Gilfillan Azel Scope. This position data, accurate to ± 15 feet, is relayed to the pilot who uses it as a fail-safe navigation aid. Given his precise position, the pilot can make corrections for drift, instrument lag and pressure changes immediately. An audial instrument, GCA aids the pilot without further saturating his vision and flight panel.


Gilfillan progressively developed GCA:
Model MPN-1 for AAF, 1942-43
Model MPN-3 for US Navy, 1945
Model CPN-4 for USAF, 1946-47
Model CPN-4, FPN-16 for USAF
Model ASR-1, PAR-1 for CAA, 1948-49

wer Console. Gilfillan's new remoter equipment pipes GCA o the tower from the field antenna unit. Now GCA is operd by regular tower personnel from a compact, two-scope er console. Gilfillan replaced bulky five-man, multi-scope ipment (MPN-1), with today's modern single operator ipment. Consolidation of all GCA features into the two-pe, one-man console is one of Gilfillan's finest achievements.



World-Wide. 80 Gilfillan technical experts supervise GCA at USAF bases the world over. Gilfillan installed GCA overseas for TWA, AOA, and Turkish Air Force, and in Canada for the RCAF. GCA built by Gilfillan for the CAA is soon to be in operation coast to coast. Gilfillan schools train GCA crews for the CAA, USAF and RCAF. Supervising all phases of GCA at airports around the world is standard Gilfillan procedure.

RCA INTERNATIONAL DIVISION

EXCLUSIVE EXPORT DISTRIBUTORS

*Ground Controlled Approach

GCA

Gilfillan

LOS ANGELES

NAVAL AVIATION

In almost any major port in the country you can see long lines of Navy ships laid up with their hatches battened down and the armament covered with fiberglass preparations to keep out the ravages of weather and time. To Navy men, these vessels are "in mothballs" or "canned." However, it wasn't until very recent times that "canning" took place in reality. NAS Pearl Harbor is fast becoming the Navy's largest "cannery" actually processing aircraft engines for storage in 200-pound steel containers.

The process is the result of Navy experimentation to develop a more efficient and less costly method of preserving engines until they are needed. When an engine arrives at Pearl for overhaul and repair, it is completely disassembled and the parts sent to the various repair shops for cleaning and repair. After each part is checked the engine is then reassembled and sent to a test cell for a trial run.

After it is completely checked, it is then partially disassembled and the canning process begins. Accessories and small parts are stored in a cylindrical drum 12 feet in diameter. The block, cylinders, exhaust stacks and wiring are covered with preservative compound and the assembly is mounted on a board and set over the accessory section. Over the complete unit is placed a cylindrical cover which is securely bolted and sealed. Every 24 hours for five days the can is checked for leaks. If any are found, the can is corrected for storage. The Navy expects that the cans can be left in forward areas for two or more years without any damage to the engine. The completed can stands about eight feet high and is about 12 feet in diameter. The whole process costs about $400.

Navy jets will soon be burning a new fuel that would clog the valves and form soft carbon in your automobile. The new-type fuel, a hybrid of gasoline and kerosene, is far more economical than previous types and will soon be standard for all jets, Navy or Air Force,

Known as AN-F-58, the fuel is lower than the 70 octane that is used for automobiles, and ranges between 50 and 65 octane. Previous fuels for Navy jet aircraft had an octane rating range of from 115 to 145.

Use of the new fuel will not materially change performance but with altitude it will improve slightly. Due to its low boiling point of about 115 degrees (kerosene is almost twice that figure), cold weather starting will be made far easier. Navy jets will not be required to undergo modification to handle the fuel. Since AN-F-58 is cheaper to produce than gasoline, the high jet fuel costs to the Navy will be reduced appreciably.

Little Known Dates in Naval Aviation—July 4, 1942, Lieutenant Roger Groundloop, pilot of a Keystone patrol bomber returned to NAS San Diego to find the bay area fogged in. Not having a convenient GCA unit tucked away in his flight jacket, Groundloop was in a spot. However, he spotted some birds diving into the fog and figured that he could do anything they could. Down dove a gull into the soup and down dove Groundloop in hot pursuit. The gull did rolls, wingovers, loops and split-S but couldn't shake our boy Roger. Moral: There are a few things that Navy pilots can't do! But . . . finally the gull set down in the branch of an avocado tree.

The Marines demonstrated some of their combat tactics and techniques, featuring tactical air support of amphibious operations at Marine Corps Schools, Quantico, Virginia, recently before members of the 81st Congress and top generals of the Marine Corps.

The all-day show was highlighted in the afternoon by a demonstration of a lightning raid into "enemy" territory by combat Marines flying in helicopters from a simulated carrier far out at sea.

Several Piasecki HRP-1 transport helicopters swooped into the target area, landed a reinforced platoon of troops, and were gone quickly while Marine *Phantom* jets and *Corsair* fighter planes laid covering smoke screens and hammered "enemy" positions with strafing, rocket, and bombing attacks.

Other helicopters slipped in at tree-top level behind the smoke screen and delivered light artillery with its crews to support the troops on the ground, or laid telephone lines, landed supplies, directed artillery fire, and evacuated "wounded" from the field of action.

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PROP WASH

Aero Oddities

High Tide. An unusually hard rain flooded a stream behind an AF emergency air base in Costa Rican jungle. River backed up, buried field under 36 inches of water. Food was getting short so when low drone of aircraft engines was heard, men at base waded out into the open. C-45 circled overhead, then dropped canvas bag. C.O. grabbed bag, extracted small parcel on which was inscribed "Have food for you, but this is only

DETACH AT BROKEN LINE

DEAR READER

Because we don't want to be caught up here with our flaps down, we're anxious for a word from you. SKYWAYS is your magazine, and as your editors we want to know what you want. Look over the questionnaire, then give us your answers. Reply promptly as only 100 readers will receive a free copy of the next three issues of SKYWAYS.

QUESTIONNAIRE

What stories and regular features did you enjoy the most in this July issue? On the lines to the right of the titles grade each article: 1—Good; 2—Fair; 3—Not interested in subject; or 4—Phooie!

Is It Safe to Fly?..... —— *Air Service Plus*..... ——
Pilot's Report: Clipper..... —— *Departments:*
Bombs for the '36..... —— *Dilbert*..... ——
Every Pilot's VHF..... —— *Opera. Engineering*..... ——
Jet Mascot..... —— *CAOA News*..... ——
Cross-Country Is Easy..... —— *C.A.P. News from Hq.*..... ——
They Called it War..... —— *Air Your Views*..... ——
Big Wind Factory..... —— *USAF News*..... ——
Announcing: Helioplane..... —— *Naval Aviation*..... ——
Stop, Look and Relax..... —— *Prop Wash*..... ——

Do you like articles on military flying?.....Personal flying?.....
Are you interested in technical or semi-technical articles?.....If so, on what particular subjects? ..... , ... , ...
Would you like to read articles on personal flying experiences?.....
Do you like Special Aircraft Sections?.....What are your suggestions for future issues of SKYWAYS? .....
.....
What subjects would you like Bill Odom to write about?.....
.....
Do you buy SKYWAYS on newsstand?.....A subscriber?.....

Something about you, but not too personal:

Name: ..... Address: .....
Pilot's License: Student.....Private.....Commercial.....ATR.....A&E.....
Military Rank:.....Today: Res. .....Active.....
Age: Under 21.....; 21 to 30.....; 30 to 40.....; 40 to 50.....; over 50.....
Do you own a plane?.....If so, what make?.....
If not, do you expect to buy one?.....
Do you use airlines?.....If so, how many miles per year: Domestic.....International?.....

Fill out and mail to: Research Dept., SKYWAYS
444 Madison Avenue, New York 22, New York

equipment we can offer to dry up field. If you get it dry by this afternoon, we'll be back." Parcel contained two dozen white blotters! *(R. J. Tirsch, Billerica, Mass.)*

Cadet Navigation. In early stages of Basic flight training, cadet became lost on solo hop. Unable to determine position on his flight chart, cadet contacted nearby stage ship. After being asked over what type of terrain he was flying, he was told he was somewhere near Brazos River. To provide additional aid, stage ship asked cadet in what direction he was flying so they could give him heading to auxiliary field. Cadet answered, "Straight ahead, Sir." *(F. K. Lightfoot, Jr., W. Salem, Ore.)*

Fire Bird. Pilot in jet F-80 at 18,000 feet on easterly course over Lake Michigan lost his fire. An able birdman, he made 180, established glide, then headed for Traverse City, 58 miles away. Over Travers Bay, he dropped wing tanks, circled toward field, made perfect "dead" landing at Traverse City Field. *(J. Hatch, La Crosse, Wis.)*

Smoothing Oil. In early days of Airmail, pilots used "smoothing oil" to take vibration and sputtering out of their engines. This oil was kept in bottle, usually quart or fifth, under pilot's seat and was taken internally when engine began to malfunction. Today, term "smoothing oil" is used in telegraphic correspondence by airmen living in dry states when they contact buddies from more liberal states who may soon be flying in to visit them. Many a wire has read, "Please bring full baggage weight allowable of best grade of smoothing oil." *(D. Downie, Pasadena, California)*

Hot Landing. Pilot of four-engine *Tudor* airliner doing development flying decided one day to visit some RAF buddies at airfield some miles away from home base. Tudor pilot landed at air field, found place deserted. Annoyed, he returned to his headquarters. Few weeks later, he learned from his friends that he had landed on a mined field few miles to one side of RAF base. *(J. S. Webb, London, England)*

Pilot with Pull. Farmer's wife, ill and unable to get into town, needed to have two teeth pulled. Farmer phoned dentist, reported roads impassable because of mud, but said he would come in and get him. Dentist met farmer at airport, was flown to farm where he pulled the woman's teeth, then was flown back to town . . . all in an hour. *(Mrs. P. Buddenberg, Hamilton, Mo.)*

Wrong Place Kick. Boy, playing football on field next to airport, kicked ball. Football hit plane coming into airport for landing, smashed prop, caused engine to be jolted out of its setting, but pilot was able to land ship without damage. *(D. M. Powell, Ayrshire, Scotland)*

Precision Bombing. Operation Snowbound plane, near Casper, Wyoming, bucked headwinds of from 90 to 105 mph, flew at airspeed of 95 mph, dropped 28 bales of hay, one after another. All landed in small area within inches of each other. *(C. E. Peterson, Minneapolis, Minn.)*

Knocked for a Loop. Student pilot with only two hours of solo came in for a landing in Aeronca *Chief* with trim tab all way back. At altitude of 100 feet student discovered he was too high and coming in too hot to make landing so he jammed throttle forward. In his excitement, however, he also horsed back on wheel. Result . . . student executed complete loop, regained level flight about 25 feet off ground. Very scared but determined student pilot went around again and made successful landing on second try. *(C. R. Frieze, Corvallis, Oregon)*

Att'n Readers:

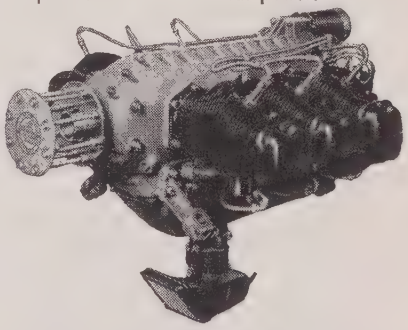
If you have any news note oddities pertaining to aviation, send them to SKYWAYS, Box 17, 444 Madison Avenue, New York 22, N. Y. Five dollars will be paid the sender of each "oddity" printed. Contributions cannot be returned unless accompanied by stamped addressed envelope. The decision of the editors is final.

3 TIMES 'ROUND THE GLOBE

NON-STOP!

It was a stock Continental C145 which kept Bill Barris and Dick Riedel in the air in their Aeronca for *six full weeks* — a new mark. They flew 75,000 miles, non-stop, equivalent to three times around the world.

Engine stamina played a major role in setting this new record. And the safety, economy and dependability resulting from that stamina are available to you, for your everyday flight, in a wide variety of personal and executive planes with Continental power.



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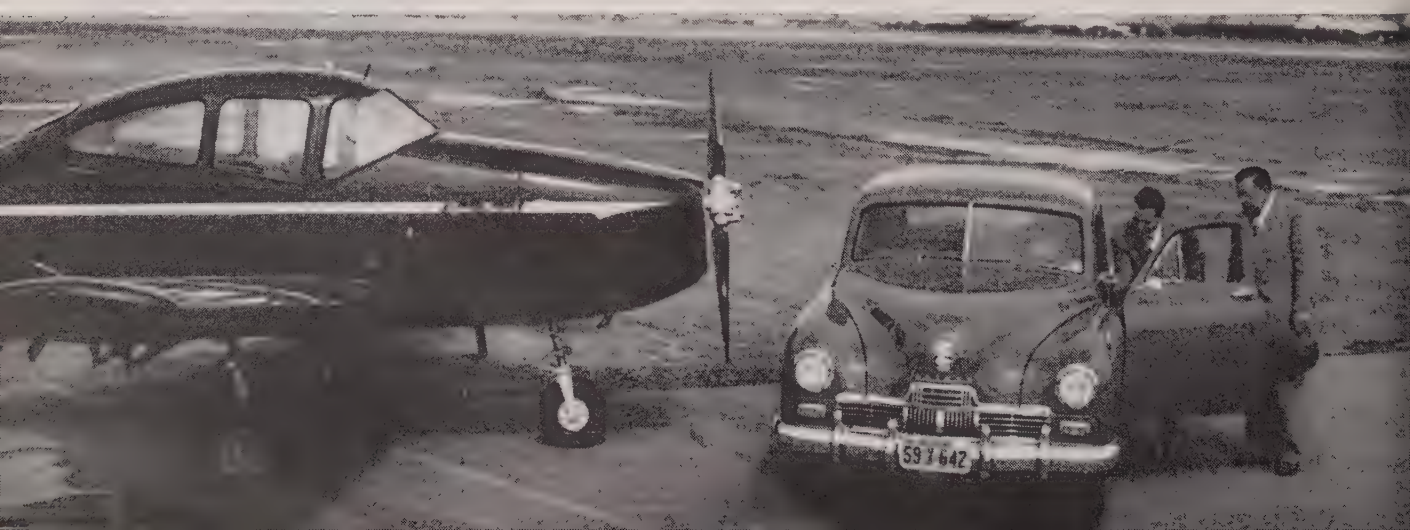
Is It Safe To Fly?

SAFETY of private flying has increased 31.4 per cent since 1940, or more than three times the improvement shown by autoists



RADIO AIDS have done much to make private flying safe, and its safety record is showing constant improvement

PILOTS in 1948 numbered 715,541, and many a plane owner, like Larkey here, used his plane for extensive trips

By JAMES W. BATCHELOR

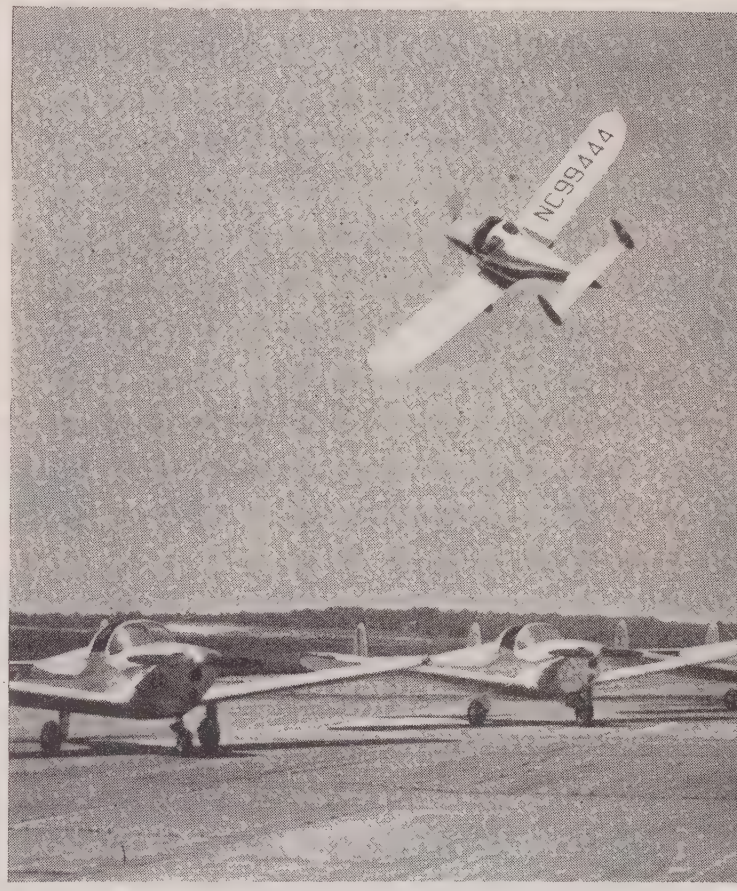
General Counsel of United Pilots & Mechanics Assn.

THIS question is in the minds of thousands of Americans who have the urge to own and fly an airplane but have never dared undertake it. Though the urge to fly has intrigued man since he first beheld the graceful antics of the birds in flight, he has always contemplated it with the awe and childish admiration which makes him feel that flying is something above and beyond the ability of the average man to achieve.

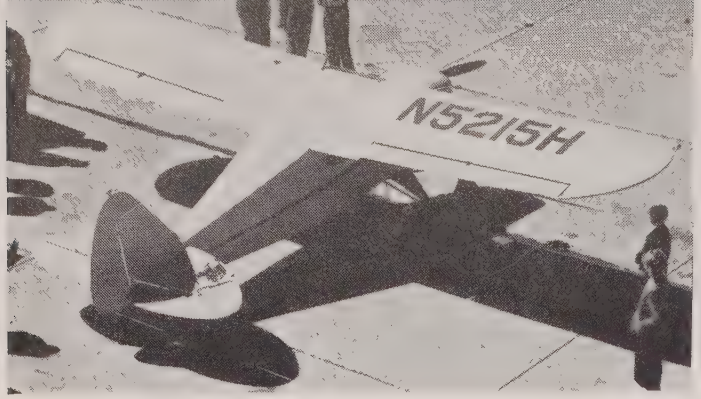
Early converts to aviation were showered with praise and admiration for their achievements—not the type of praise and admiration given to those who plan and labor for achievement on a sound and sensible basis—but the sort that is shown to the "Man on the flying trapeze." Naturally, a "superman complex" developed in many of the old-timers who learned to fly. The public accepted them as such for nearly 30 years. During that period the "superman" concept crept into government and the idea still prevails in many regulations governing the industry today.

Until World War II focused public attention on aviation, the public had given little thought to the uses to which aviation could be adapted. The realization came that aviation, which had been regarded as a plaything for daredevils, sportsmen, and the idle rich, could be made to serve, with the proper development, guidance and understanding, as a decisive instrument of war and a sane and sensible mode of transportation in times of peace. It was also recognized that aviation rated headlines because of intense public interest, and publicity seekers chose it as a means of attracting public attention, sometimes to the detriment of aviation.

While the airline industry spends an estimated $500,000 per year in Washington to explain its aims and accomplishments to the government and the public, *(Continued on page 44)*



AIRMEN owe it to private flying to report infractions of rules against flying like this *(above)* demonstrated by *Ercoupe*. Safety in flying is up to pilots themselves, and careful maintenance *(below)* is a pre-flight necessity



CUB CLIPPER has wings three feet shorter than those of *Cub* trainer. The new ship proved popular at every airport

FULL LOAD carried by frisky *Clipper* consisted of four and a half passengers, plus baggage and camera equipment

Pilot's Report...

The Cub Clipper

By DON DOWNIE

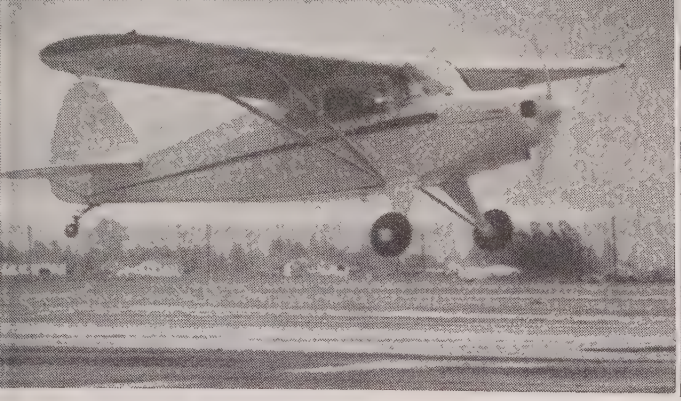
MORE darned fun—and easy to fly too! They cut three feet off each wing tip of the old *Cub* trainer, souped up the engine, fattened up the fuselage to permit four people in it and called it, rightly enough, the *Cub Clipper.*

Now you can take four people for the price of two.

You should see the surprised airport spectators when four people climb out of this chunky little 29-foot puddle-jumper. It's built as an economy model for the "average payroll," yet in spite of its low cost, the *Cub Clipper* is as pleasant and as frisky a little airplane as I've ever flown.

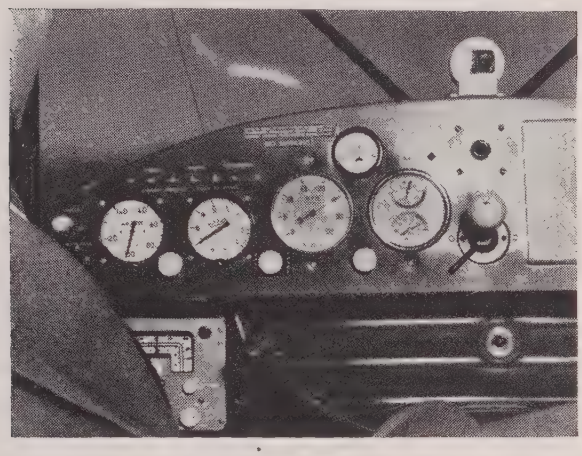
The *Clipper* used for this SKYWAYS' pilot report was the first of the new models to reach the Pacific Coast. N5215H was picked up on a drizzly spring afternoon from distributor Harvey Martin at the Long Beach Municipal Airport.

Since the new four-place *Cub Clipper* is designed primarily for family usage, we put four adults and our six-months-old daughter in the



CLIPPER rode through bad weather exceptionally well. Its landing characteristics are tops . . . on the ground at 50 mph

ROOM for all is shown in this photo. Author and Mrs. Downie sat in front, the Rex's and baby Downie in back



INSTRUMENT PANEL photo was made in flight at 7,000 feet with full load. Note *Clipper's* radio lower left panel. Anxious to see how other half lives, Downie brought new Clipper into L.A. Municipal Airport, parked near *Connie*

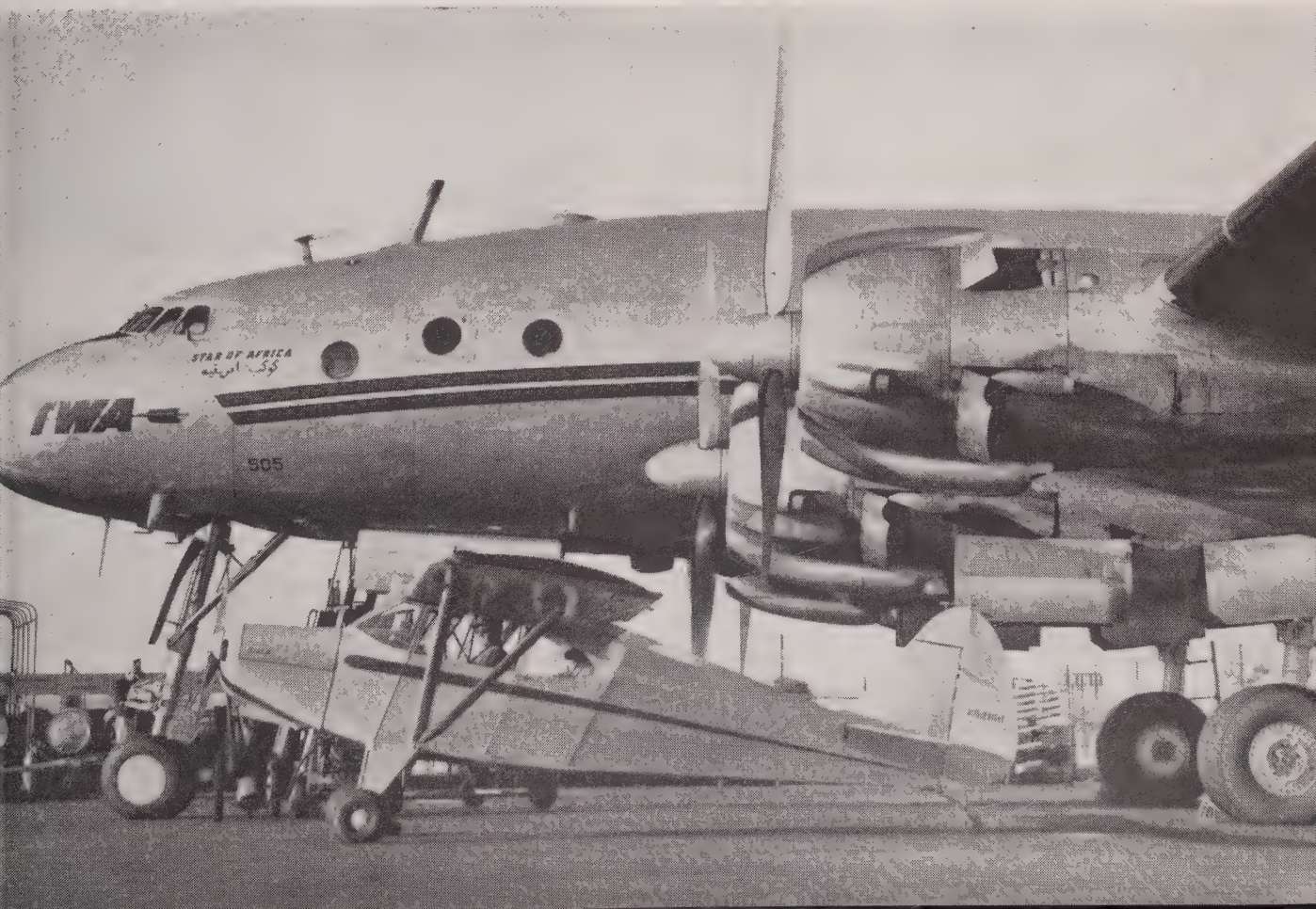
cabin and headed out on a short weekend tour. Guinea pigs on this trip, besides Mrs. Downie and little Dana, were Lois and George Rex.

After the rain clouds lifted to airport minimums, William Shackett, Mr. Martin's Sales Manager, introduced George Rex and your reporter to the new airplane. We were to pick up the girls later at the Monrovia Airport.

"Where is it?" we asked as we walked down the flight line. The only *Cub* in sight looked like the *Cub Vagabond,* the little two-place model.

"That's it," said Mr. Shackett.

You've got to be right on top of this little airplane before you can be sure it isn't the two-place model. The wing span and fuselage dimensions are identical and the ship has the same



FAMILY PLANE is good name for new *Clipper*. In addition to four adults, little Dana Downie and luggage rode ship

chunky appearance throughout that distinguishes the two-place *Vagabond*. Unless the rear door, located on the left side of the fuselage, is opened, you can't be sure you have the *Clipper* until you can see inside the cockpit.

Experiments were originally conducted at the Piper factory during the war to study the effect of clipping the wings of the *Cub* trainer. It developed that a shorter wing had virtually the same rate of climb and other performance characteristics as the original 35-foot model, while the cruising speed was higher and there was a more "solid" feel to the clipped-wing model. That was the beginning of the *Cub Clipper*.

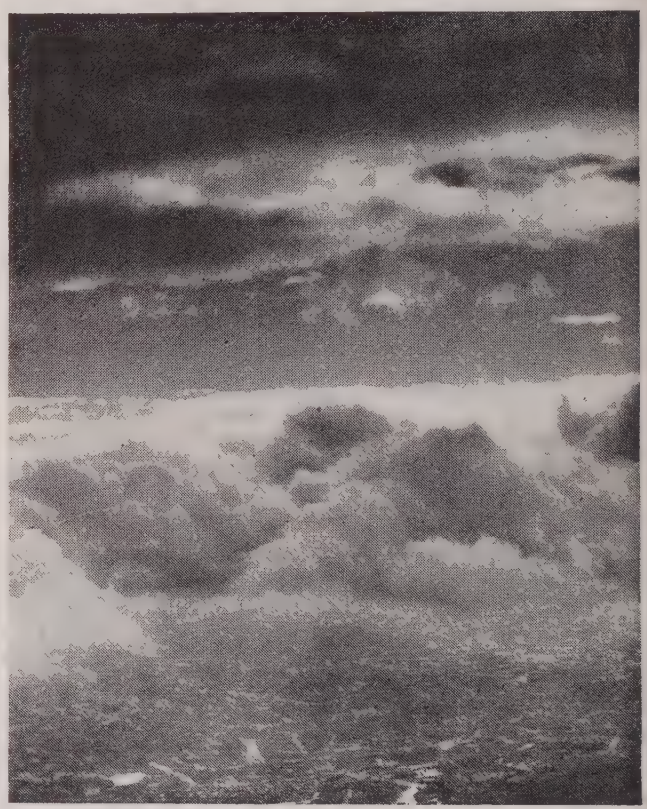
The framework of the ship is all metal including aluminum spars and nicral ribs. It is fabric-covered throughout.

"The only thing they show you at the factory before you pick up one of these," said Mr. Shackett, "is where to find the starter. You reach way back under the pilot's seat and press that button. It's always 'hot;' that's why it's hidden so carefully since you can press the starter button, even with the master switch off, and the engine will turn over.

"This ship is stock," continued the salesman, "except for the radio, navigation lights and the prop spinner. It is, however, a 'deluxe' model that costs $100 over the rock-bottom $2995 price. This extra cost covers the 'plush' upholstery job."

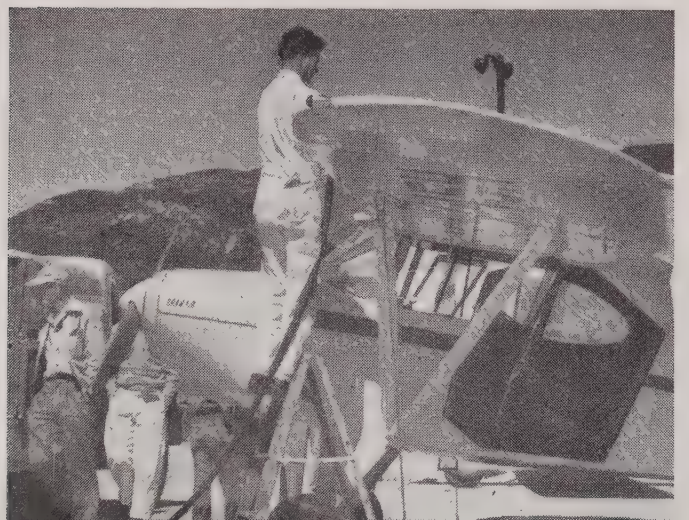
Without having a chance to compare this ship against a non-plush model, it is impossible to evaluate the difference. However, the upholstery and interior appointments on this little ship were of surprisingly good quality and very easy on the eyes.

"It's all yours," said Mr. Shackett as he ushered us into the ship. 'The best rate of climb is 75 mph. If you come in high on the final approach,



STORM over Los Angeles didn't hold up flight operations of *Clipper*. Equipped with radio, it rode through easily

CLIPPER gas tanks hold 30 gallons. No smoking is permitted in cabin because one gas tank is behind the firewall

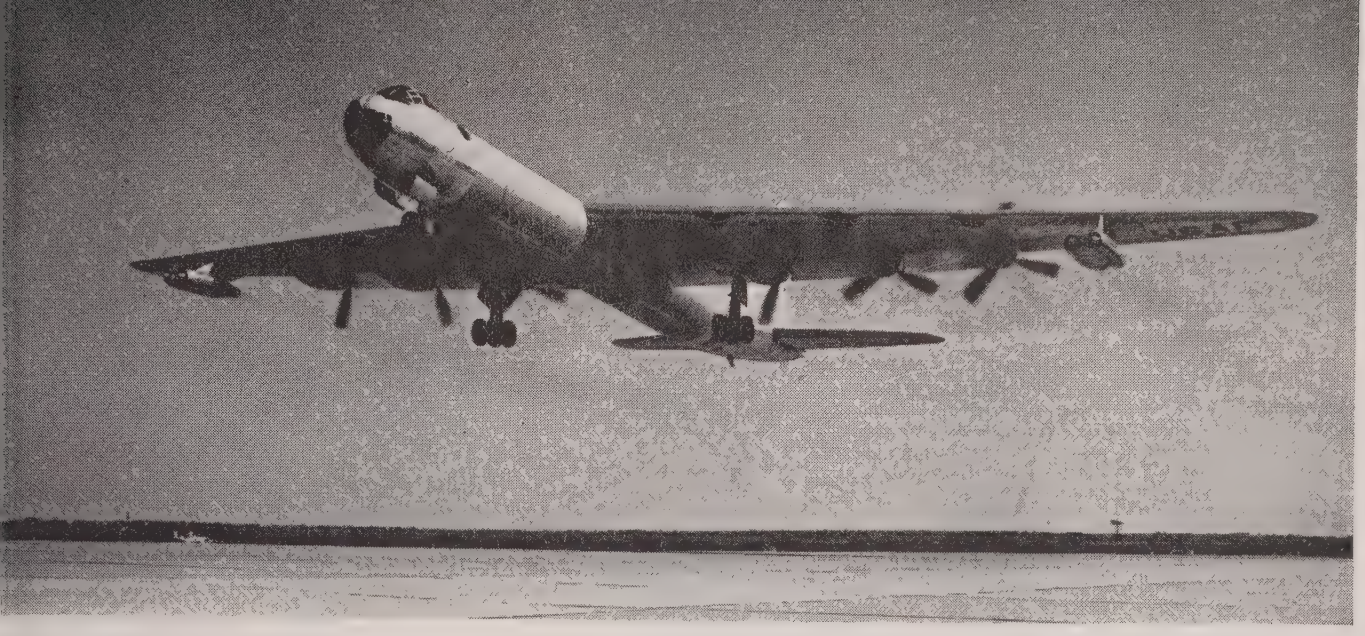


just cut the power and haul the nose up to 70 or 75 mph. It'll mush downstairs just as though you had flaps."

With that meager bit of instruction, we fired up the *Clipper*, called the tower and taxied out for take-off.

As with many of the newer planes, take-off is made from a nearly three-point position. As soon as the tail starts up off the ground, the pilot should begin to ease back on the stick. Then, presto, you're in the air!

With only two of us in the airplane and full gas tanks, the *Clipper* goes up like a sky-rocket. We had nearly a thousand feet over the fence at Long Beach while an- *(Continued on page 46)*



GIANT B-36D, prototype shown here in take-off photo, is powered by six Pratt and Whitneys and four Allison J-35's

BOMBS for the B-36

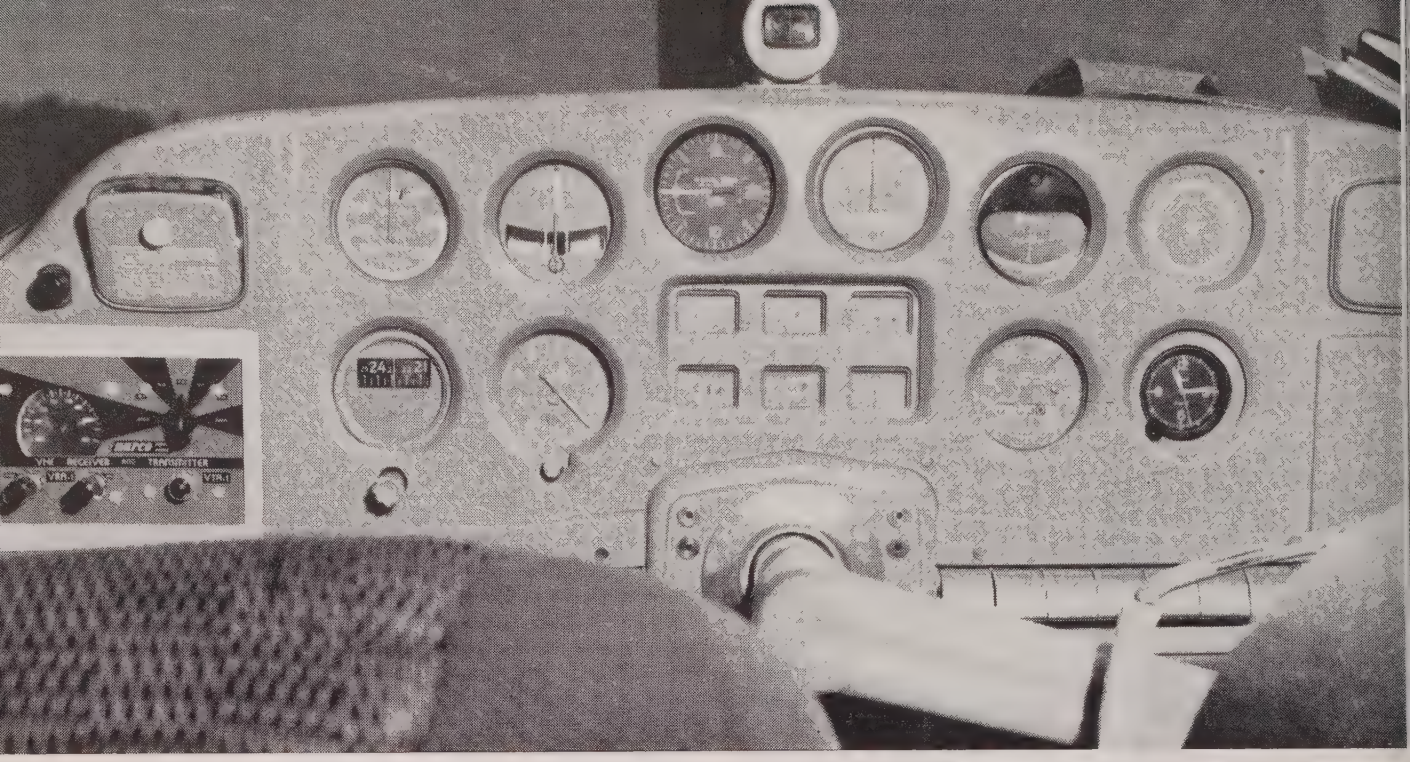
NUMBER One bomber for the Air Force is the giant Convair B-36. Number One bomb for this big bomber is the 42,000-pound bomb shown below being hoisted into the mammoth B-36's bomb bay. Two of these 42,000 pounders were carried by the ship recently on an "experimental" bombing run over the bomb range at Muroc Air Force Base, California. Totaling 84,000 pounds (42 tons), this is the heaviest load of bombs ever carried by one airplane.

During World War II, the 22,000-pound plus bomb load of the B-29 seemed gigantic and not likely to be topped. Today's load of the '36, however, dwarfs that figure and relegates the *Superfortress* to the Medium bomber class.

Newest of the '36's is the B-36D, prototype of which is shown above. This version is powered by six Pratt and Whitney *Wasp Major* piston engines and four Allison J-35 turbojets which enable the giant bomber to take off with a gross weight of 280,000 pounds in 3500 feet of runway. Speed of the Convair B-36D is given simply as "in 400-mph class." On a test flight recently, the B-36D was aloft for three hours, 15 minutes and reached an altitude of 40,000 feet.

The Air Force has ordered 39 additional B-36 bombers (B-36D), plus modifications on previously ordered '36's.

BOMB LOAD on recent B-36 run over bombing range at Muroc Air Force Base, California, was two 42,000-pound bombs



NARCO OMNI-RANGE installation is shown in this photo. Receiver, transmitter is on left; L-R Meter is above the RPM

Every Pilot's VHF

By HARRY GRAYBILL

THE gadget says, "Bear left a bit! Now you're getting back on course . . . you're nearly on it . . . now you're on course. Start flying that heading again!" The Narco omni-range *Left-Right Meter* doesn't actually put it into so many words but, without actually speaking, it does tell you which way to head your plane to get or stay on your course.

VHF and its prodigious child, omni-range, have been here in various stages of refinement since before the war. The real news now, however, is that two-way VHF plus perfected omni-range is available to the private pilot in a size and weight suitable for the smallest plane and at a price comparable to those currently quoted for conventional low-frequency installations.

If you're not familiar with this equipment,

PILOT-AUTHOR Harry Graybill *(below, left)* looks on as Jim Riddle, president of Narco and pilot of *Bonanza*, outlines route for test hop in which the author tried out the Narco omni-range equipment for readers of SKYWAYS

don't be awe-struck at the prospect of meeting it. As far as using it is concerned, there's nothing to it—except a near complete solution of your navigation headaches all at one blow.

Quite needlessly, I was very apprehensive about how I'd get along with this mysterious new gimmick—omni-range. I have held a commercial license and a flight instructor's rating for several years, but strictly in the putt-putt category, and the gadgets with which I've felt at home are all to be found on a standard lightplane. This, incidentally, is through choice because I'm a booster for flying for everyone; and it's not for everyone if it calls for proficiency in the use of a lot of highly complicated and high-priced extras. At the moment, radio in general is still, for the smallest ships, an extra; but the time is approaching when it will be standard equipment on personal planes.

I met and was completely sold on Narco's omni-range in one easy lesson. Narco stands for National Aeronautical Corporation, located at Wings Field, Philadelphia, which developed and designed the set under contract to the CAA and to the CAA's specifications. The equipment I used was installed in Narco's Beech *Bonanza*. Jim Riddle, president of Narco, accompanied by Tom Hall Miller, brought the Beech into Westchester County Airport. There C. B. Colby, Secretary of CAOA, and I eagerly got aboard. This was not, however, before I'd made it clear that my knowledge of radio was on the nil side. This confession apparently was the best thing I could have said, for Riddle and Miller joyfully assured me they could better demonstrate how easily and satisfactorily the neophyte can use this equipment on his very first try.

Familiarization takes about one minute. First, there are the compact VHF transmitter and receiver units which are mounted under the extreme left end of the *Bonanza's* panel behind a combination Narco panel designed for single-package installations. Just under this is mounted a small panel which has, on the left, the *Course-Selector* dial reading from 0° to 360°, with a knob in the middle for turning it; and on the right, the *To-From Meter* which is just a needle that points either to the word *"To"* or the word *"From"* or somewhere between the two. Finally, there is the *Left-Right Meter*, mounted on the *Bonanza's* main instrument panel, somewhat to the right of center. This *L-R Meter* is a vertical needle that points either toward the left or toward the right, depending on your plane's position in relation to the course to be flown. There is a reason for the off-to-one-side location of this instrument. Though you can suit yourself, it's best to place this meter a little bit out of the way, so it won't compete in position with the compass and, in the case of this ship, the directional gyro. After all, you still fly your courses primarily as you always did—*viz.*, on a compass heading. The *Left-Right Meter* simply tells you when your *heading* has let you get off your *course*. If the needle swings to the left, your chosen course is off to your left, and vice-versa. The degree the needle has moved from center indicates the relative amount you are off your course. You can't very well "fly" the needle as you do your compass, because the needle does not swing back to center as soon as you change your heading. Instead it stays where it is and only moves back to center as you eat up the distance between your off-course position and your selected track over the ground. Incidentally, these three omni "controls" or instruments have been standardized by the Army, Navy and CAA. The *Left-Right Meter* especially is thought to be a great improvement on the cathode-tube television-type indicator *(Continued on page 50)*

LEFT-RIGHT meter on panel of the ship is pointed out by Jim Riddle in briefing Pilot Harry Graybill on installation

RECEIVER antenna for omni-range equipment is V-type, a result of 18 months of research on the part of the CAA

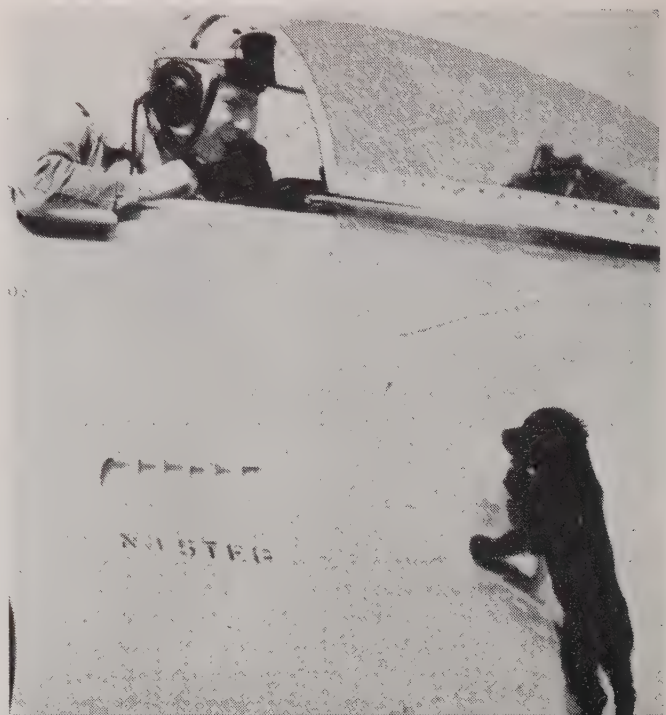
HOME to "Jet" is cockpit of Capt. Sederberg's F-80. Here "Jet" sits waiting for the Captain to come aboard and be off

JET MASCOT

THERE is probably no more down-to-earth custom that is American than having a mascot . . . and there's probably no more up-in-the-air mascot than "Jet," the black cocker spaniel pup that belongs to Capt. Robert S. Sederberg of Chicago, Illinois.

En route to Lockheed's plant in California to pick up an F-80, Capt. Sederberg of the famous Fourth Fighter Group of Andrews Air Force Base, Washington, D. C., stopped off at Williams Air Force Base, Arizona. A bingo game was scheduled for that evening, and Capt. Sederberg took part. Result . . . one prize for the jet pilot, and that prize the black cocker spaniel pup that Sederberg quickly named "Jet," for obvious reasons. Only a few months old, "Jet" already has many hours in the cockpit of the F-80's. . . . Thus far, "Jet" seems to enjoy her mode of travel but, like all small dogs, the world seems a mighty big place . . . even when "Jet" covers it by jet.

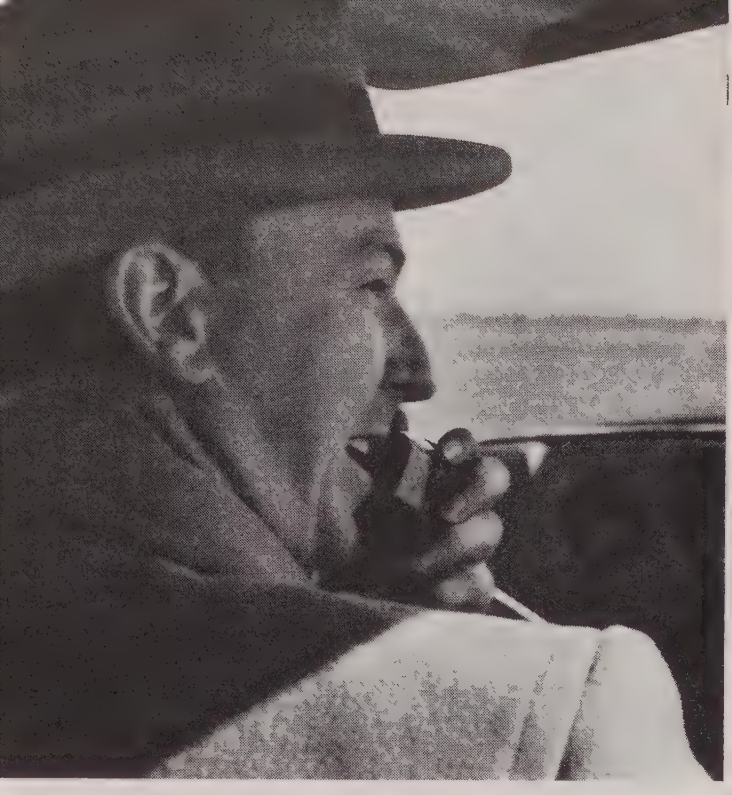
JET the dog meets jet the plane for first time when Capt. Sederberg flew back to Andrews Base with "Jet" on his lap



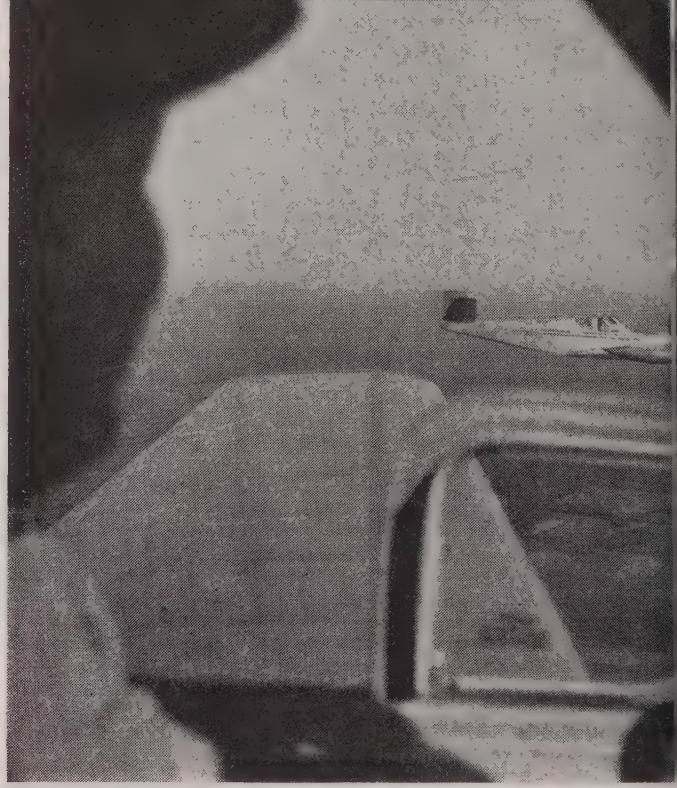
FUEL for the F-80 coming up, "Jet" finds her boss' chute comfortable sitting while the JP-1 boys fill the F-80's tanks. Capt. Sederberg's pen gets a chew while he fills out weather forms *(below)* prior to take-off for Andrews

PRIZE among prizes, the little cocker *(above)* patiently waits for some lucky person to win her. Some lucky fellow did, and it was jet pilot Capt. Sederberg *(below)* who took "Jet" home with him in the cockpit of the F-80

GEAR gathered, "Jet" takes a minute to wonder what her new home at Andrews is going to be like. P. S. She likes it fine



PILOT-AUTHOR ODOM calls tower for instructions prior to take off on cross-country. The ship is Bill's own *Bonanza*



WING-TIP companion is a friend of Odom's flying the famed "Waikiki Beech" that Bill hopped from Hawaii to New Jersey

CROSS-COUNTRY IS EASY

By BILL ODOM

Photos by Bill Price

THE best way to learn how to fly cross-country, I've always figured, is to fly cross-country. If you can't manage any long cross-country flights, try short legs around your home

PATTERN for X-C calls for weather check. Then while warming up engine, Bill sits in ship, pre-computes headings

ODOM'S own plane, as well as "Waikiki Beech" which he is here directing to parking position, has complete instrument panel with all radio aids that a ship the size of a DC-6 would carry. Radio is Bill's choice for navigation

airport, always with an eye out for landmarks.

If you can't do that, just think, dream and cogitate about cross-countries. That helps too.

I met an old fellow once who practiced his cross-country technique from the rear window of an Eastern Airlines DC-3. I happened to sit next to him one night, and before we'd even left the ramp, he'd taken out a complete set of charts for the route we were to fly. As soon as we were airborne, this 65-year-old man began identifying landmarks, plotting headings and computing ETA's. When it got dark, he identified every beacon and town along the way.

How many private pilots would think of doing anything like that?

Essentially, cross-country flying is easy.

But it's also important, because what makes a well-rounded pilot is the experience a man gets on trips away from his home field. After a certain point in any pilot's experience, the actual stick time in an airplane becomes relatively unimportant. But the increasing backlog of navigation experience a pilot logs on X-C's makes the difference between a Sunday flyer and an adequately equipped, all-around pilot.

Of course to me, navigation—and especially long-range navigation—is the best part of flying. I don't imagine all pilots would agree with me on this point, but I've found that cross-country flying has continually grown on me.

My first long trip was in 1937 when I got the job of delivering a *(Continued on page 53)*

PANEL on the plane is set up according to Odom's own instrument arrangement *(above)*. G-meter is above VHF receiver, then altimeter, airspeed, bank, and rate of climb. Below them is artificial horizon and Sperry Gyrosen compass

They Called It WAR

WEATHER was always the Airlift's main hazard. Thanks to GCA, however, the cargo kept coming in despite fog and rain

Boys of the Airlift called it war without guns, but war nevertheless

By J. DAVIS SCOTT

The author accompanied Bob Hope and his NBC radio show to Berlin. The trip was made under the auspices of the U.S. Air Force, and the purpose was to provide entertainment for the 15,000 GI's who were manning the various Army and Air Force installations in and about Berlin.—Ed.

I PRESSED my face against the window of our heavily laden C-54 and looked down a full mile to the earth beneath us.

At first glance the countryside didn't look much different than the farmlands of Pennsylvania.

Yet, there was a difference. When you fly from coast to coast across America, you become accustomed to seeing farmhouses and barns set down in the middle of nowhere. These little homes, with their farm buildings, located in the midst of a rolling landscape . . . or on the side of a hill . . . or deep down in a valley . . . are the

AIR TRAFFIC controllers at Tempelhof Airdrome keep their fingers on the pulse of salvation for Berliners

GCA OPERATORS watch the scanning screens and talk the heavy laden transports to safe landing despite weather

ROUND-THE-CLOCK ROUTINE at busy Tempelhof Airdrome is shown in this time-exposure night photo. Note light paths of ships

identifying marks of America. The countryside I was looking at from our C-54's window bore no such identification. Here was a cluster of red tiled roofs . . . here was another . . . and between them miles of fields and woods. The homes here were always together, always in a tightly knit little group. The lonely farmhouses of America were nowhere to be seen.

And the woods looked different, too. These forests had a carefully cultivated look. The green, spruce forests ran nearly to the top of the beautiful snow-capped mountains to the north of the line of villages. And the rows ran straight and true . . . like the rows of corn on the sizzling plains of Iowa and Illinois.

This was a new land to me, a new land with a new look. Suddenly, however, my thoughts were interrupted. The pilot of our plane, a good-looking kid in his early 20's and dressed from head to toe in an Eskimo-like fur outfit, turned and said:

"We'll be landing in Berlin in 10 minutes."

This was Germany I was watching unroll beneath me. This was an Airlift plane. Eighty minutes ago we had taken off from Wiesbaden, a one-time Rhine River health resort, 280 miles to the west. Now, we were in the 20-mile-wide air corridor over the *(Continued on page 47)*

BOB HOPE and company were flown to Berlin to entertain the 15,000 GI's in that area. Among those in troupe were Irving Berlin and Jinx Falkenberg. Bad weather dogged their trip, too, as shown in control-tower photo *(below)*

BIG *Wind* FACTORY

HIGH SIERRAS provide wind currents that make for exceptional glider flights, but these same winds, passing over towering snow-capped peaks of mountains, often play havoc with powerplanes. If you fly that section, watch those winds

OPERATOR of Bishop Airport in wind factory area is Bob Symons

THERE's a part of this country where pilots have trouble getting their planes down out of the sky!

There was nothing unusual when Harlan Ross and Dick Lyons took their Cessna 140 to 19,500 feet—except that they did it with the switches cut and the propeller stopped!

When Bob Symons zoomed his surplus P-38 from 35,000 feet, he had both throttles closed and was indicating 300 mph. The only remarkable item was his 500-foot-per-minute rate of climb! How high is down, you might ask.

Naturally, this is where the national glider altitude record was broken twice within two days. There could be no better place.

No pipe dream or gin-mill fabrication, this big wind factory lies along the Owens River Valley of eastern California where the City of Los Angeles obtained its original water supply. Strong westerly winds passing over the towering snow-capped peaks of the High Sierra Mountains create this area of phenomenal rising and falling air currents. To a lesser degree, however, these same conditions are found on the downwind side of every range of mountains.

Bob Symons, veteran operator of the Bishop Airport, is the local expert on these king-sized updrafts and their sign posts, lenticu-

By CHASE CRAWFORD

SOARING record-maker Johnnie Robinson climbed to 33,500 feet on the lenticulars in this famed area of rising air

GLIDER PILOTS go for these wind areas, but to powerplane pilots these areas can be nightmares where you spin up

lar (lens shaped) clouds that form up to 60,000 feet above the valley floor. With his year-'round flying near the peaks adjoining 14,495-foot Mt. Whitney, the highest mountain in the United States, Mr. Symons qualifies as some sort of an expert on the relatively unknown "wave" action of winds in the lee of large mountains.

"Frequently we have visiting pilots scared half to death when they land their lightplanes here at Bishop," says Symons. "They tell hair-raising stories of being sucked up to altitudes of 15,000 feet and higher without being able to do much about it. We pour them a cup of hot coffee to calm their nerves and then point out the high, thin lenticular clouds that usually indicate this standing wave condition of rapidly rising air.

"Just for the fun of it, I take my P-38 up in these conditions and cut the throttles back to 10 inches of manifold pressure, just enough to keep the engines warm. Frequently I can climb over 1,000 feet-per-minute at an indicated 170 mph and reach 35,000 feet; yet the turbo-superchargers are inoperative on my ship. On one flight it actually took me 30 minutes to get down from 35,000 feet to 20,000 feet.

"On the other side of the ledger," says Symons, "I have been dropped 2,000 to 3,000 feet per minute with full throttle in perfectly smooth down drafts at 15,000 feet."

OXYGEN equipment, demonstrated here by Paul MacCready, is a must

Flat-land pilots may scoff at some of the wild stories that come out of this big wind factory, but Symons and his fellow High Sierra pilots have many a barograph trace to back up their statements. Symons has recorded a solo flight to 23,000 feet in a Cessna 140 between Bishop and Independence. The only reason that he didn't go any higher was that this flight was made on the spur of the moment and no oxygen supply was carried.

On a demonstration flight, Harlan Ross took this same Cessna to 23,500 *(Continued on page 58)*

CLOUDS behind these flying fishing enthusiasts show partial overcast at Bishop Airport, with lenticular clouds above

PHOTOGRAPHER flying at 12,000 feet over Bishop Airport took this picture of lenticular clouds

NEWEST PERSONAL PLANE is the two-place Helioplane that will take-off with full gross load in less than 100 feet

Announcing

The Very New Helioplane

Its landing area—a tennis court; its low speed—a mere 27 mhp!

THE newest and most exciting development in the field of personal aircraft is the announcement of the Helioplane. If you've ever dreamed of having an airplane that could be flown safely at a speed as low as 27 mph and could land and take-off in an area no larger than a tennis court, then your dream has come true in the Helioplane. Designed by Otto C. Kopper of MIT to specifications set by Dr. Lynn Bollinger, former pilot and now member of staff of Harvard Graduate School, the Helioplane appears to be conventional in almost every respect.

A two-placer, the Helioplane is powered by 85-hp Continental engine that turns a constant-speed, high-lift prop developed by Aeromatic. The ship has top speed of more than 100 mph. An extra bonus in the Helioplane is the fact that it does not make any more noise than your 1949 automobile!

SKYWAYS August issue will feature a detailed report on this new and startling Helioplane.

LARGE FLAPS permit the Helioplane to develop tremendous power at take-off, enable it to get off at sharp angle

CRUISE under full control is possible down to a speed as low as 27 mph. Its top speed is well over 100 mph

FOLLOW instructions closely and emergencies aren't apt to happen. Note ship's window latched, cowl flaps open

PRE-FLIGHT calls for shock-strut check while mechanic makes sure tires are correctly inflated to 28 pounds

PLANES won't fly long with little gas, so Fulton makes sure his tank is topped, ship has required amount of oil

KNOW your instrument panel blindfolded. Here Fulton checks himself while another pilot calls the shots

If you keep your head when you're flying, emergencies won't deal you a K.O.

By NEIL FULTON

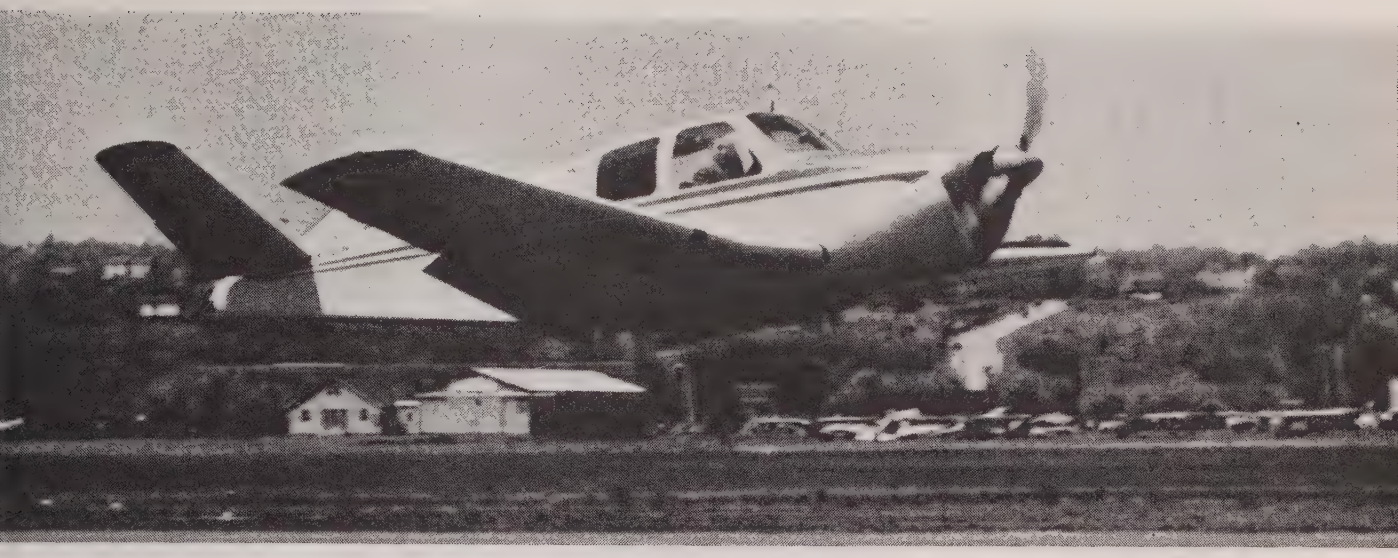
(Formerly Chief Pilot, Atlantic Aviation Corp.)

PANICKY thinking in the cockpit of a personal plane during a flight emergency is probably more responsible for accidents during forced landings than the defect, mechanical or personal, that caused the original trouble.

Far too many private pilots, especially those in the 50- to 500-hour class, go so haywire when their planes act up in flight that their uncontrolled reactions actually cause accidents to happen.

Fred E. Weick, aircraft designer and Director of the Personal Aircraft Research Center of Texas A. & M., recently issued the results of an analysis of personal-plane engine failures during 1947. The study is a searching inspection of the mechanical reasons for powerplant failures, involving engines up to 200 horsepower, that led to accidents. Weick's summarized findings lead to an unstated conclusion that while design and mechanical defects may have been the primary causes of the accidents, awkward piloting probably aggravated the seriousness of the emergencies.

The one fact that 95 per cent of the flight mishaps resulted in forced landings proves that flight emergency-landing procedures require continuing emphasis long after the period of student flight training is over. Frankly speaking, most



LANDING GEAR "jammed" in "up" position, Fulton demonstrates his preference for coming down on hard-surfaced runway to avoid snagging part of plane and cart-wheeling. This doesn't happen often, but . . . know what to do if it does

private-plane pilots today are totally ignorant of how to recognize an emergency, how to determine its seriousness and just how to go about counteracting the probable wind-up of the flight.

You're flying along at about 4,000 feet on a cross-country and suddenly your engine begins sputtering, cutting in and out. What would you do first? Do you tighten up, wondering what you're going to do about making a forced landing, or are you relaxed and sitting easy as you check your instruments and look around for a possible open space for setting the plane down? *Are you sure you have to make a forced landing?*

The relaxed pilot, the one who is sure of what he's doing, doesn't have to ask himself anything as he begins making the *(Continued on page 56)*

APPROACH missed or landing interfered with, Fulton follows correct procedure to regain speed, and goes around again

stop, look and relax

AIR SERVICE PLUS

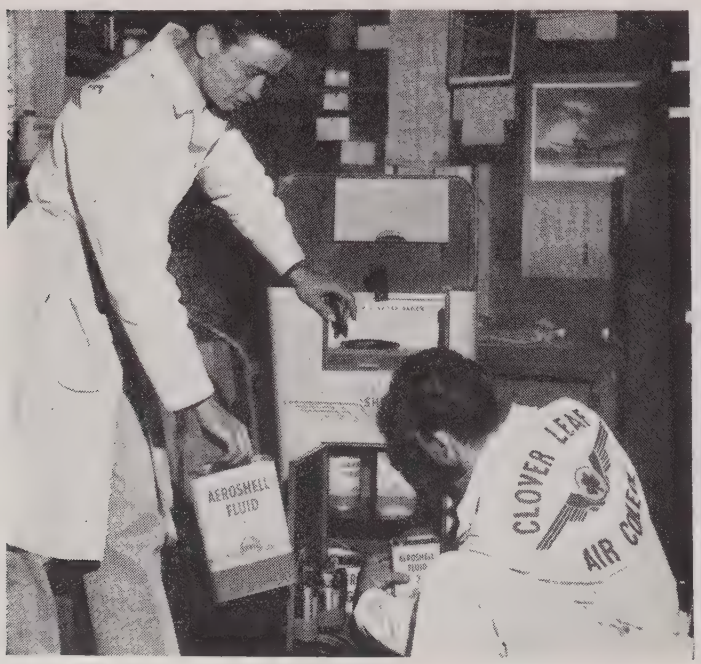
MOVIE MAN Brian Donlevy flies his Ryan *Navion* over to Clover Leaf Field for service

SOMEONE once said, and practically everyone has agreed, that the range of an airplane is the distance to the next rest room. We all know that the rest room situation at many airports is not good, and in some cases aircraft service isn't any better. As far as plane owners are concerned, their Number One requirement is *service,* service for the airplane, that is. Perhaps one of the most popular fields in this country is Santa Monica, California's Clover Leaf Field, and the service station, Clover Leaf Aviation is owned and operated by movie stars Jon Hall, Frances Langford and Robert Young.

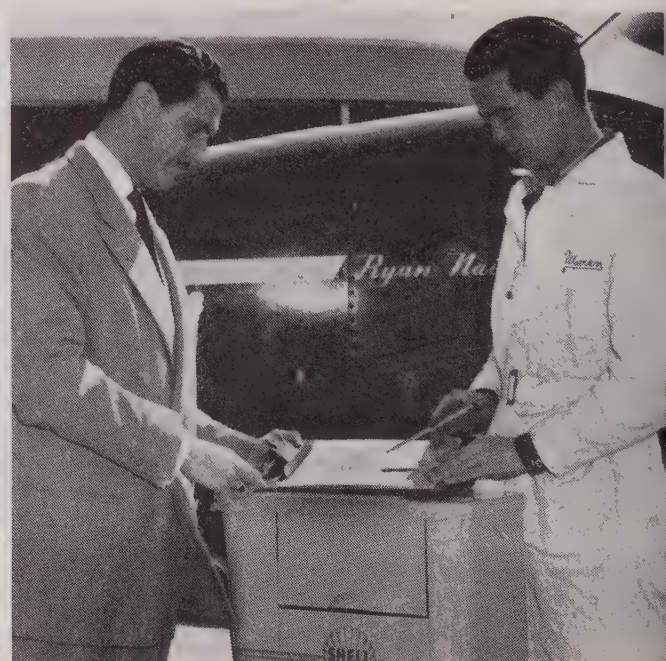
Featuring a lubrication system developed by Shell Oil, Clover Leaf Aviation offers to the plane owner the quality service autoists have enjoyed for so long. Whatever your plane's need, Clover Leaf Aviation's servicemen have at their finger tips the parts and facilities for performing that serice efficiently and quickly.

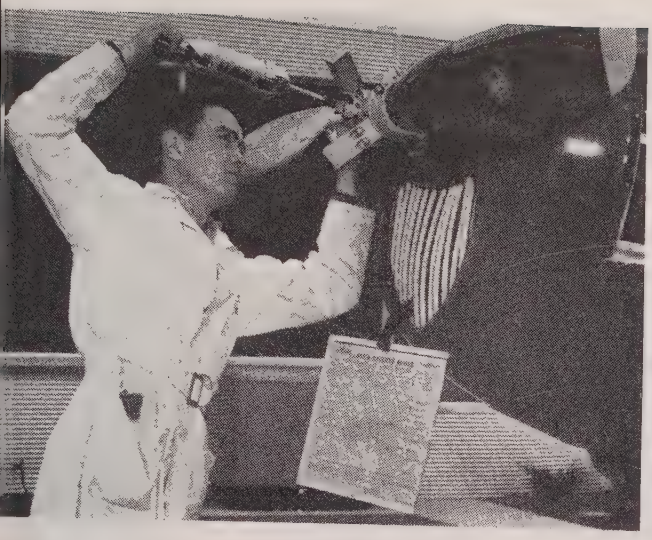
In addition to their *Navion* dealership, Clover Leaf Aviation provides service for all aircraft and also operates one of the best air colleges in the country. No wonder the field is popular.

CLOVER LEAF mechanics stock their portable lubrication unit which they'll wheel out to plane to be serviced

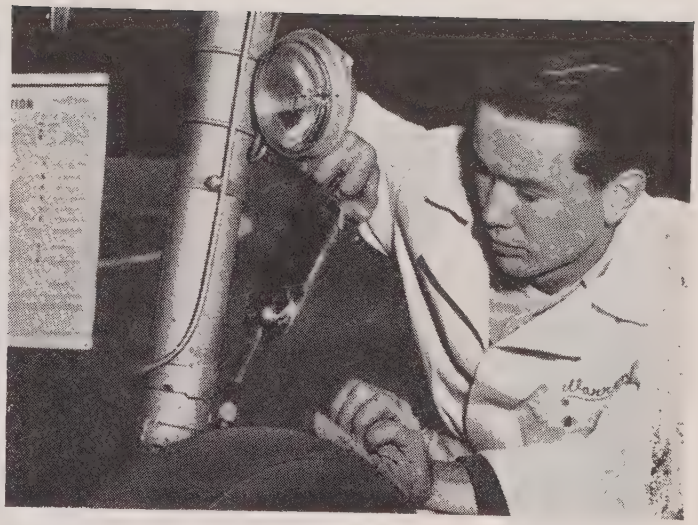


MECHANIC goes over service chart for *Navion* with Clover Leaf Aviation's general manager, George S. Oberdorf

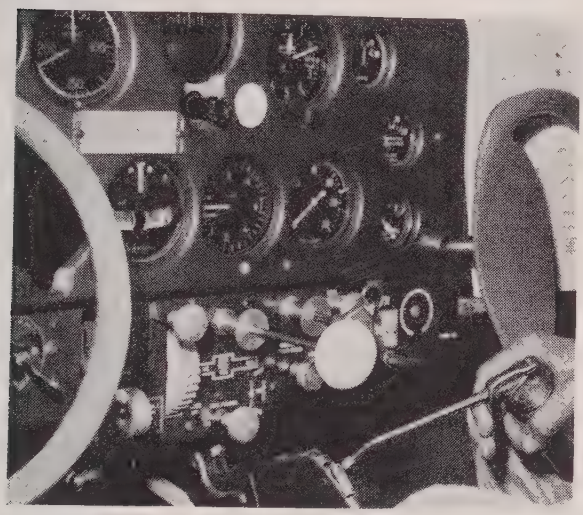




SHELL lubrication chart, hung on nose of *Navion*, gives mechanic specific instructions for lubricating all parts of the *Navion*. Mechanic *(above)* uses gun to lubricate Hartzell prop. Then moves inside *(below)* to oil controls



LANDING GEAR strut gets a shot from the gun *(above)*. Note portion of *Navion* lubrication chart now hung under belly of ship. Elevator trim tabs get periodic oiling, too *(below)*. Good service means better flying for all

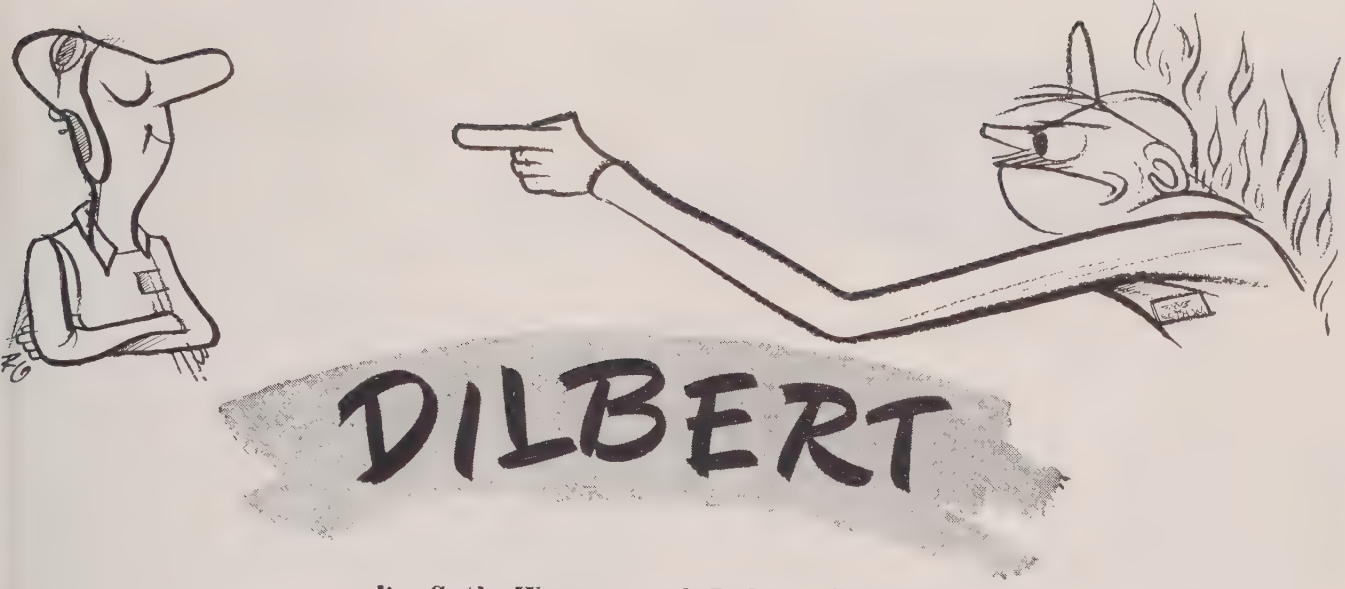


OWNERS of Clover Leaf Aviation are Jon Hall and his wife, Frances Langford. Third owner is Robert Young.

In addition to Ryan dealership, Clover Leaf Aviation operates a very fine air college for pilots and mechanics

Copyright 1949 SKYWAYS

Dilbert didn't swivel neck before he started this take-off!



DILBERT

By Seth Warner and Robert C. Osborn

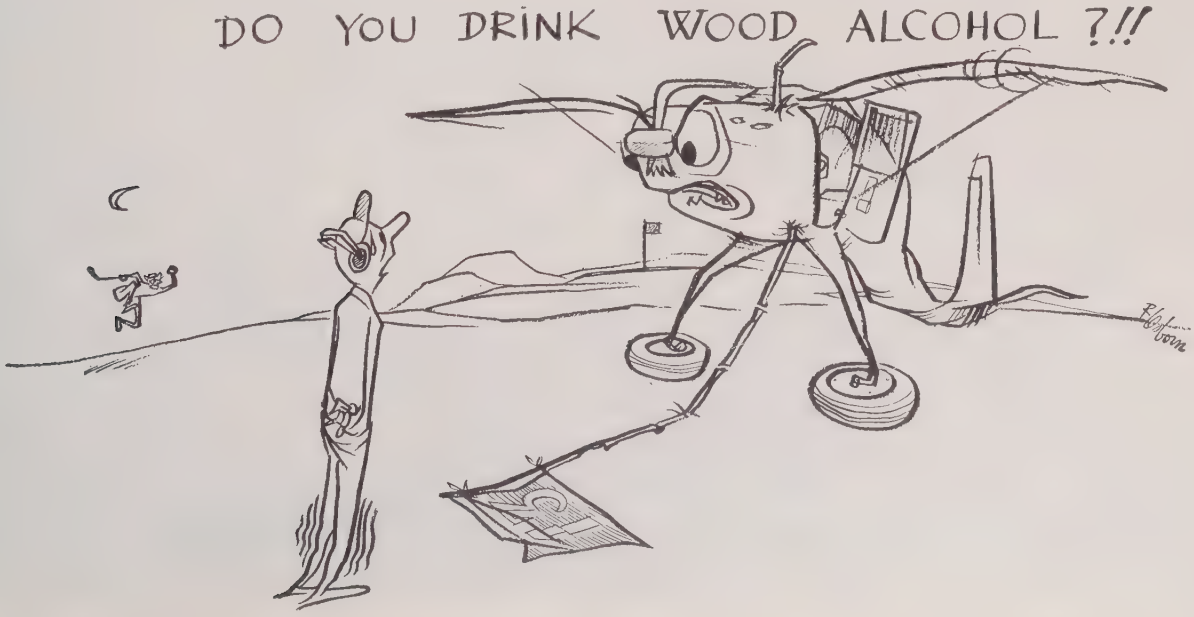
All or Nothing—During his pre-flight check, Dilbert noted that two of his engine cowl fasteners were loose, and tried unsuccessfully to secure them. Being in a hurry, he decided against waiting while they were replaced. "She'll hold for another flight. I'll have it done when I get back."

Everything functioned normally until Dilbert, forgetting he had a loose cowl, decided to have a little fun. He nosed over to pick up speed for a loop, and when he pulled back all hell . . . . er . . . I mean cowl broke loose. It smashed his windshield and so damaged his tail section that the plane was thrown out of control. Dilbert finished the flight via parachute.

Replacement of all inoperative fasteners *before* take-off should be on your "must" list. Never let it be said of you, "For want of a fastener, his plane was lost."

Get it into your bean that flight safety, like pregnancy, is an all-or-nothing proposition—you can't have partial safety, any more than you can be a little bit pregnant.

Never Compromise—In aviation, also, there are sins of omission as well as those of commission. Although estimating that part of his flight would be made after dark, Fly-By-Night Dilbert took off without testing his running lights. The light switch was out *(Continued on page 64)*



Operational Engineering

Service Notes : Ryan Navion

PROPER maintenance will keep your airplane flying. As an "extra" aid to that maintenance, SKYWAYS herewith brings you additional service notes, applying in this case to the Ryan *Navion*. However, any problems concerning maintenance, service or operation of the *Navion* should be submitted to the Ryan Aeronautical Company, Lindbergh Field, San Diego 12, California, or your local dealer.

GROUND OPERATIONS
ROUTINE SERVICING.

Fuel Tanks: The *Navion* has one aluminum alloy fuel tank in each wing with a three-quarter-gallon aluminum accumulator tank connected between them to provide a common sump and insure a supply of fuel during maneuvers. The system holds 39½ gallons of fuel and is serviced through a single filler neck in the right wing. *Important:* Fill the fuel tank to the top of the filler neck. To assure maximum capacity, allow time for fuel to transfer to left tank, then resume filling.

For draining the system, a fitting at the forward end of the accumulator tank, reached through an access hole under the wing to the left of the center rib, provides a fuel screen and tank drain. Adjacent to the drain is a petcock for the *daily* drainage of accumulated water from sump.

Fuel quantity transmitter and indicator: Fuel quantity is measured electrically through a transmitter actuated by a float arm installed in the aft side of the left fuel tank. Because of wing dihedral, the indicator measures only 0 to 30 gallons. The difference between 30 gallons and the tanks capacity (39½ gallons) is consumed before the indicator needle will move off the 30-gallon mark, but the indicator accurately records fuel level from 30 gallons down to zero, with a variation of one gallon in reading allowable.

Oil system: The left section of the hinged engine cowling provides access to service oil at the top left side of the engine for the 10.5-quart capacity wet sump system. Oil should be maintained at the *full* level, following the reference lines on the dip stick set below the oil filler neck.

When draining the oil at each 25 hours of engine time, remove the engine drain plug, reached through an access door in the lower engine cowling, and allow the oil to drain. Then replace and safety the plug. Complete the draining of the system by removing the plug at the bottom of the oil cooler by-pass valve at the engine side of the cooler. Replace the plug and safety.

Hydraulic system: The one-third gallon capacity hydraulic reservoir mounted at the forward left side of the firewall supplies oil to the master brake cylinder in addition to serving the hydraulic power system for operating the landing gear and wing flaps. A dip stick attached to the reservoir filler cap indicates the fluid level. This should be maintained at *full*. Service with AN-VV-0-366 or AN3580 fluid.

The system is drained by disconnecting the line at the bottom of the reservoir to empty that unit, and the system drainage is completed by disconnecting several lines at the lowest point in the system. Reconnect all lines after draining.

Fuel pumps: The engine-driven fuel pump, located at the right side of the rear of the engine incorporates a strainer that should be cleaned every 50 hours. An electrically driven emergency fuel pump is located in the lower forward right-hand section of the fuselage, reached through a removable baffle. This pump should be adjusted for 12 pounds of pressure and should be checked without engine running to determine proper operation.

Tire inflation: Main landing gear tire pressure is 25 psi; nose gear tire, 30 psi. *Caution*—Do not install valve-core-remover type cap on the valve stem of the nose gear tire, use only the short bonnet type.

Landing gear shock struts: Service with AN-VV-0-366 or AN3580 fluid. The filling and inflating operations follow normal routine and precautions for air-oil struts. With the airplane resting on the gear without jacks, 1 5/16 inches of the main-gear pistons and 1½ inches of the nose-gear piston should be exposed for proper inflation.

Battery servicing: A 12-volt, 34-ampere-hour Exide battery is mounted just aft of the seat in the luggage compartment.

MAINTAINED and serviced properly, the Ryan *Navion* will provide its owner with thousands of hours of safe and sure flight

PLANE MODEL	ENGINE		FUEL GRADE	OIL			TANK CAPACITIES	INTERVAL	APPLICATION
	MAKE	MODEL		Ground Temperature					
				Above 70° F.	70 °F. to 20° F.	Below 20° F.			
Navion	Continental	E-185	80	SAE 40	SAE 30	SAE 20	Engine Oil—10 qt. (Approx.) Fuel, Main—39½ gal.	25 = 25 Hours 50 = 50 Hours	= Grease Gun = Oil Can = Hand

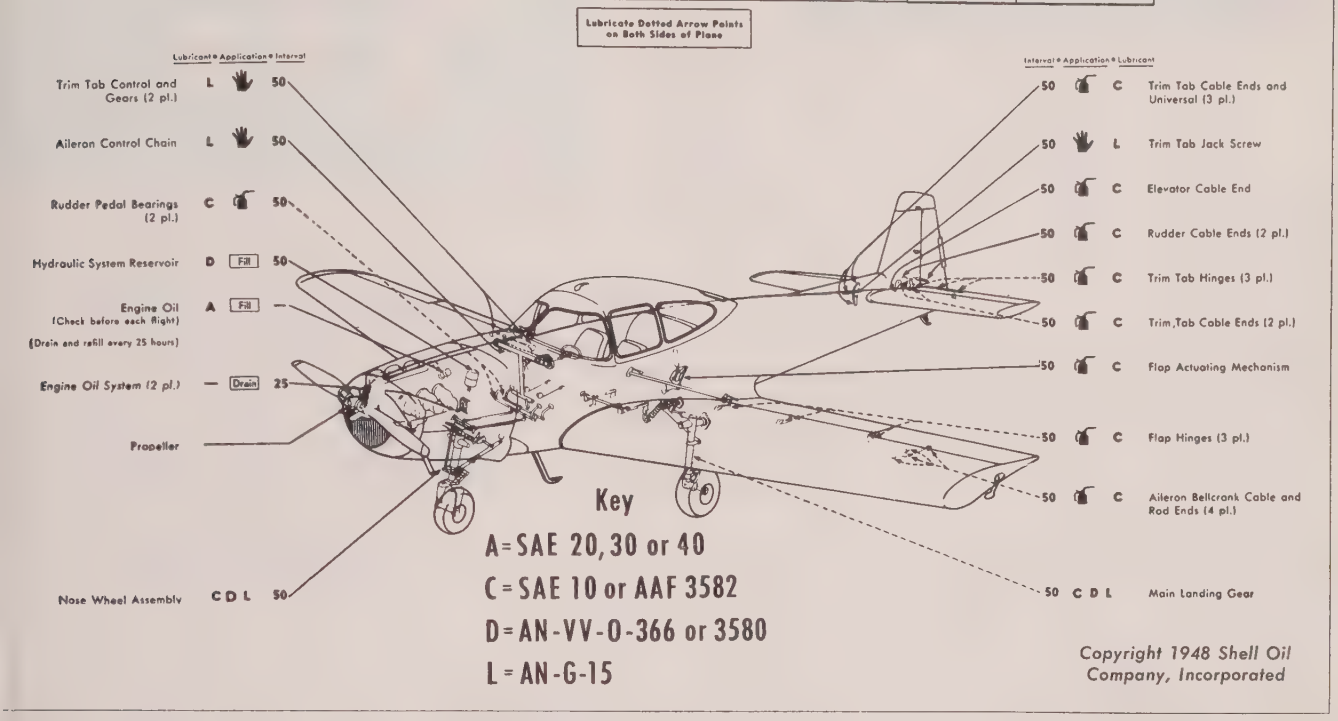

Lubricate Dotted Arrow Points on Both Sides of Plane
Lubricant • Application • Interval
Trim Tab Control and Gears (2 pl.) L 50
Aileron Control Chain L 50
Rudder Pedal Bearings (2 pl.) C 50
Hydraulic System Reservoir D Fill 50
Engine Oil (Check before each flight) (Drain and refill every 25 hours) A Fill —
Engine Oil System (2 pl.) — Drain 25
Propeller
Nose Wheel Assembly C D L 50
Interval • Application • Lubricant
50 C Trim Tab Cable Ends and Universal (3 pl.)
50 L Trim Tab Jack Screw
50 C Elevator Cable End
50 C Rudder Cable Ends (2 pl.)
50 C Trim Tab Hinges (3 pl.)
50 C Trim Tab Cable Ends (2 pl.)
50 C Flap Actuating Mechanism
50 C Flap Hinges (3 pl.)
50 C Aileron Bellcrank Cable and Rod Ends (4 pl.)
50 C D L Main Landing Gear
Key
A = SAE 20, 30 or 40
C = SAE 10 or AAF 3582
D = AN-VV-O-366 or 3580
L = AN-G-15
Copyright 1948 Shell Oil Company, Incorporated

CHART illustrates the key points requiring periodic lubrication, the kind of lubricant to be used and how the lubricant is applied

When removing the battery, remove battery and metal battery case together to prevent the possibility of spilling acid during the operation.

Propeller lubrication: Check Aeromatic propeller for proper amount of lubricant at 50-hour intervals and add as necessary Aeromatic Lubricant 7F, a semi-fluid grease that may be obtained in one-pound cans from either a *Navion* dealer or the propeller manufacturer. Check the lubricant level by turning the propeller so that the ⅜-inch filler plug is on the bottom. With the prop in this position, remove the No. 1 high-pitch stop bolt, stamped "1h". Then remove the filler plug and apply the approved lubricant with a gun through the filler until grease comes out the high-pitch stop bolt hole. Replace the stop bolt. Do not use a substitute grease as it may damage the prop oil seals and bearings.

Hartzell propeller lubrication—Every 50 hours add Hartzell propeller grease or AN-G-15 at the two hub grease fittings as necessary.

POWER PLANT TIPS AND TOLERANCES.

Ignition system: Equipped with two impulse-drive type Eiseman LA-6 magnetos. Ignition wiring is completely radio shielded and the plugs are Champion CIOS 14 mm. spark plugs with a recommended gap setting of .020, plus or minus .002 inch. Installation torque is the normal 300 to 360 inch-pounds.

Oil system: The engine pressure regulating valve is pre-set at the factory to relieve pressure in excess of approximately 90 psi, while the non-adjustable oil cooler relief valve is set to open when a pressure drop across the cooler due to congealed oil exceeds 25 psi.

Carburetor air filter: The filter in the intake duct should be removed and cleaned at least every 50 hours of flight or every six months, whichever comes first. The filter should be cleaned in unleaded (white) gasoline or other suitable cleaning fluid, agitating it dirty side down in the fluid and then dried thoroughly. After drying, immerse it in engine oil, grade SAE 20 or 30, from two to five minutes. Before re-installing, let the excess oil on the filter drain from two to four hours to prevent clogging the screen.

Carburetor: Bendix Stromberg Model PS-5C. Engine should idle at 600 rpm with the throttle closed. See the *Navion* Service Manual for adjustment instructions.

Hydraulic pump: The engine-drive hydraulic pump is located on the lower right side of the engine accessory section. The pressure output in the system is controlled by a relief valve on the firewall below the hydraulic reservoir and is adjusted to open automatically at 1125 and 1150 psi.

Vacuum pump: Navions equipped with a gyro instrument panel have as extra equipment a vacuum pump, suction relief valve, oil separator, suction gauge, directional gyro and attitude gyro. When installing the vacuum pump, the hydraulic pump is moved from its normal right accessory drive pad to the lower drive pad under the generator and the vacuum pump is installed in its place on the right. The vacuum relief valve is mounted on the right forward side of the firewall and is adjusted to give a minimum reading of 3.75 inches Hg. at 1,000 engine rpm at sea level and not more than 4.25 inches at maximum rpm.

FLIGHT CONTROLS TENSION AND TRAVEL.

Aileron and flap control systems: If aileron and flap trailing edges are over one-quarter-inch out of alignment, adjust aileron and flap rigging equally to align edges within one-quarter-inch tolerance. Aileron cable tension—30 pounds. Aileron travel—25 degrees up, 17½ degrees down, plus or minus two degrees. Flap travel—45 degrees, plus or minus two degrees.

Rudder control system: Cable tension—30 pounds. Rudder travel—20 degrees, left and right, plus or minus two degrees. System must be adjusted along with nose wheel steering rods for proper nose-wheel alignment and movement.

Elevator control system: Cable tension—30 pounds. Elevator travel—30 degrees up, plus two degrees, minus none; 20 degrees down, plus or minus two degrees.

Elevator trim tab control system: Cable tension—15 pounds, plus five, minus none. Trim tab travel—23 degrees up, plus or minus two degrees; 32 degrees down, plus two degrees, minus none.

GENERAL:

Removal and installation or rigging and adjustment of flight control surfaces, landing gear canopy and other major components should be done according to directions in the *Navion* Service Manual which provides singularly clear and complete instructions. J. Leichter.

CAOA REPORT . . .

CORPORATION AIRCRAFT OWNERS ASSOCIATION, INC.

Corporation Aircraft Owners Association is a non-profit organization designed to promote the aviation interests of the member firms, to protect those interests from discriminating legislation by Federal, State or Municipal agencies, to enable corporation aircraft owners to be represented as a united front in all matters where organized action is necessary to bring about improvements in aircraft equipment and service, and to further the cause of safety and economy of operation. The CAOA headquarters are located at 444 Madison Avenue, New York 22, N. Y.

First Honorary Member is Wm. P. Odom

By unanimous vote of the Board of Directors of the Corporation Aircraft Owners Association at their April thirteenth meeting, William P. Odom, famous long-distance flight record holder, was elected the Association's first Honorary Member.

Mr. Odom, an outstanding airman for some time, was voted this honor "in recognition of his accomplishments as an airman and for his promotion of the use of aircraft as an aid to industry."

A telegram was at once dispatched to Mr. Odom advising him of his unanimous election as our Number One Honorary Member.

For many years Bill Odom has been a great believer in the use of aircraft as a means to better business, regardless of the type of industry. He has done much to promote both the industry's use of the airplane and the development of better and safer executive aircraft.

His most recent accomplishment as a long-distance navigator and pilot, i. e. the non-stop flight from Honolulu to Teterboro, N. J., was made in a small executive Beech *Bonanza*. Capt. Odom arrived dressed as a business man in a neatly pressed suit and grey homburg just as a further demonstration of the ease and efficiency of modern executive air travel.

We are proud of Mr. Odom's acceptance of membership in the Corporation Aircraft Owners Association and CAOA looks forward to a mutual promotion of better executive aircraft operation.

Gas Cap Cover Plates

On the way to Denver, Colorado, to attend a meeting of the Aircraft Operators Council recently, the Secretary of CAOA ran into what might be called a peculiar situation.

After leaving Milwaukee, Wisconsin, on an airline DC-4 (actually it could have been on any one of several types of aircraft), a passenger was heard to tell the stewardess that the gas tank cap on the right wing was flapping about. The stewardess looked out and sure enough, there was the gas cap banging on the end of a chain—all because some careless serviceman hadn't completed his job by fastening the wing tank cover plate securely. In a few minutes, the slipstream pulled the cap loose from its chain and said cap zipped back past the window and just over the elevator.

When the pilot was told, he turned the ship around and went back to Milwaukee where the passengers had to sit around for a couple of hours while mechanics tried to dig up a spare gas cap. When none was found, a cap from the ship's cabin pressure system was substituted, all of which meant the pressure system was inoperable and the ship had to be flown to Denver at 10,000 feet instead of the usual 21,000 feet.

To make matters even worse, the area was covered with thunderstorms and dust storms which the airliner had to plow through instead of flying over.

The result of one careless serviceman and no replacement cap was . . . a cabin of unhappy passengers, several of whom were not a little airsick for two hours and 40 minutes, and a disrupted schedule . . . not to mention the fire hazard that existed for a time.

Let that be a lesson to all. Pilots, check those cover plates to be sure they are fastened down securely after refueling.

Display Your CAOA Decals

The official CAOA insignia decalcomanias have been sent to the members. Each member receives two decals for each of his aircraft. If desired, the decals may be varnished or lacquered for better protection after they've been put on the ships.

All members are urged to display these conservative decals as soon as possible for they will do much to introduce the Association to airport operators and interested field visitors.

Any member who has not received his decals may obtain them from headquarters by contacting the Secretary.

"Executive" Designation to Remain Suffix

Your Association approached the Civil Aeronautics Administration with an appeal for the granting of the use of the word "Executive" as a prefix rather than a suffix as now permitted.

This appeal was rejected with the explanation that "The use of company names or special identifications as a prefix in air/ground communication is limited to aircraft operated by companies which provide or contract for fixed and mobile communications facilities normally adequate for the relay of all control messages between traffic control centers and company aircraft. Please note that the use of special identifications as a prefix is an important notification to how air traffic communications between the aircraft and ground are to be conducted. It is necessary, therefore, to resolve other meanings of specia identifications to the suffix category."

The Association appreciates this concise and reasonable explanation and warns its member corporations to limit the use of our identification word "Executive" to its official status as a suffix to follow the registration number of CAOA aircraft.

Weather Forecast Check

Initiating a program to improve weather services in non-scheduled flying by encouraging pilots to report differences between weather forecast and the actual weather encountered, the Flight Safety Foundation recently began the distribution of over 2,000 "Weather Encounter Report" cards to company and individual aircraft owners. This program has the support of the United States Weather Bureau which will act on the reported discrepancies in weather reports.

The cards, to be filled out by pilots and mailed Flight Safety Foundation, compare the station forecast or report with the weather really encountered in flight. Pilots are also encouraged to radio back in-flight reports of weather conditions, and to make a note of this radio-ing back on a space provided for such information on the card. The station to which weather information was radioed should be noted on the card.

Novice flyers given a seemingly favorable forecast have undertaken cross-country trips over unfamiliar terrain only to run into serious difficulties in a few hours when weather conditions quickly deteriorated. An incident such as this happened in the Midwest recently and caused four widely separated forced landings, fortunately with no loss of life but causing considerable damage to equipment.

Another "emergency" occurred when a "weak front" was predicted. This terminology confused a flyer who interpreted its meaning weather conditions were not severe. Severe weather was encountered and an accident was the result. It is of the utmost importance that pilots be given explanations of difficulties that might arise weather-wise, en-route in such a manner as to avoid the possibility of misunderstanding.

The results of this program begun by the Flight Safety Foundation should be decidedly in favor of the private or company pilot. To insure these results, however, pilots must shoulder their part of the bargain and mail these cards to Flight Safety Foundation, 515 Madison Avenue, New York 22, N. Y., when discrepancies in weather forecasts are encountered.

CAOA is participating in this project and cards are being mailed to CAOA members, with a note urging their use.

New Members Welcomed

Corporation Aircraft Owners Association welcomes two new members to its fastly growing roster of member companies and corporations.

Lear, Incorporated, builders of aircraft radio equipment and probably one of the best known manufacturers in the field of aviation, is now a member of CAOA. Second new member is Pacific Mills, of Boston, Massachusetts, manufacturers of cotton and woolen materials.

Pacific Mills operates a twin-Beech and Lear, a twin-Beech and two *Bonanzas*.

PLANE FAX

A page of service tips for private flyers and fixed-base operators

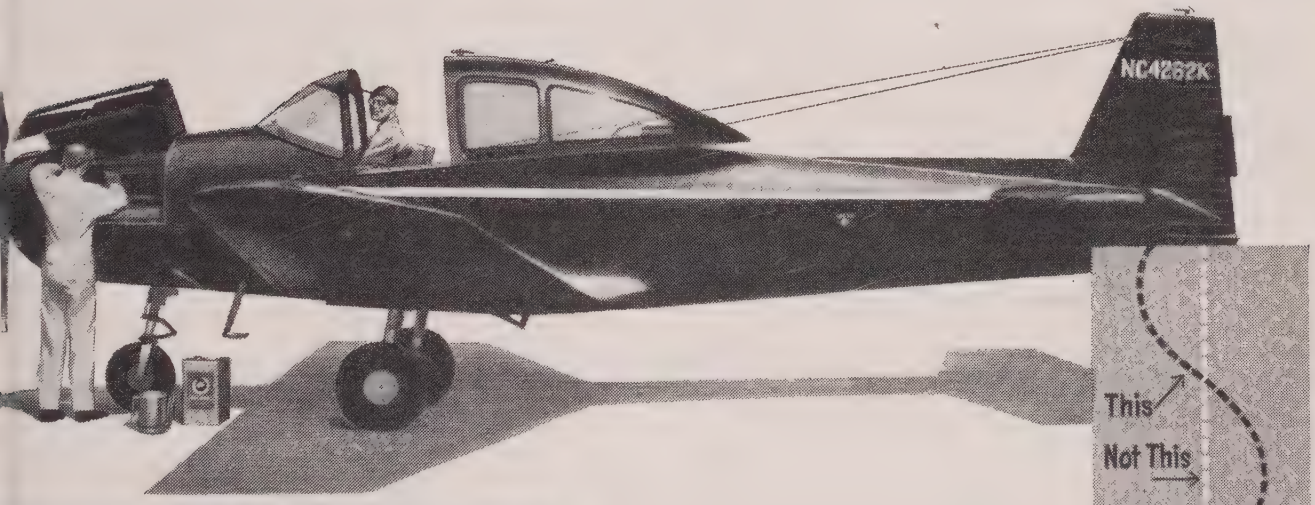
Take-off tips that cut down accidents

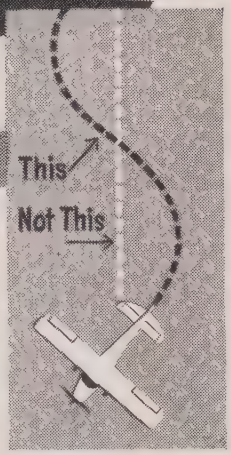
Tie down loose equipment before warming up

Good pre-take-off tip is to fasten down loose accessories and safety belts securely. They can be serious hazards, jamming the controls and causing injury to you and your plane during maneuvers.

Take off with a clean engine

Hidden dangers to safe flying are the power-robbing gum deposits that can form in your engine when you use ordinary aviation oils. For deposits will clog engine parts... may cause stuck valves and rings, and even bearing failures. But RPM Aviation Oil cleans engines as it lubricates. It contains a detergent that gently loosens and removes carbon, soot, and sludge... and prevents new deposits from forming. This special chemical actually disperses tiny foreign particles, keeps them from building up on precision-made parts. So for a clean engine and peak performance on any flight, stick to "RPM."





"Fishtail" your plane while taxiing

Failure to S-turn on the taxi strip is a common cause of ground collisions. Be sure you have good visibility at all times. Remember: A high percentage of all aircraft accidents occur on the ground.

Don't retract your landing gear too soon

Sounds elementary... but you need more runway to take off on hot summer days because of the lighter atmosphere. So be sure you're airborne before you flip up the gear. To keep your landing gear and all control surfaces running smoothly, use RPM Aviation Grease No. 1. It reduces friction... sticks to exposed parts at high speed... stays put at all temperatures.

"We take better care of your plane"

CHEVRON AVIATION GASOLINE
RPM AVIATION OIL
Standard Oil Company of California

C.A.P. News from Hq.

CAP Report To Congress—The Civil Air Patrol this winter and spring has taken tremendous strides forward in membership, Major General Lucas V. Beau, National Commander of Civil Air Patrol, told the members of Congress, dozens of generals and scores of other guests of the Civil Air Patrol at its annual Congressional Dinner, held recently at the Statler Hotel in Washington, D. C.

General Beau told the dinner-meeting in his annual report to Congress that new units were being organized throughout the nation at a higher rate than at any time in CAP's history, and that the increase in members this year already has exceeded the total increase in 1947 and was approaching the total increase in membership for 1948.

The General cited the unselfish heroism of CAP units in alleviating disasters occurring during the past year. He also complimented the completed radio network covering the entire United States and connecting with Hawaii by CAP "hams", and explained that the use of this "net" during emergency disaster disrupted normal communications circuits for days on end, had been of tremendous help to isolated families.

The dinner, the most colorful and successful ever held by CAP, was replete with "brass" from throughout the entire Air Force, and CAP wing commanders, deputies and cadets had a wonderful time discussing flying with the Air Force personnel and members of Congress who are very air-minded this year.

The cadets chosen to attend the dinner probably had more fun than the wing commanders who had to sweat out many long conferences. The National Capitol Wing took over the cadets for the duration of their visit in Washington and gave them a really royal time, with dancing in the evening at Mount Vernon School for Girls as an extra added attraction. The boys saw all the sights of Washington, tourist capital of America, including a visit to the Senate and luncheon in the Senate restaurant. Their luncheon at the Pentagon with high-ranking officers also was a highlight of the three-day holiday.

The wing commanders conferred at great length on the knotty problem of "where are we going to get the cash?", a problem that has been growing with the increased membership of CAP and one that in all probability always will be with CAP, as it is with most volunteer organizations.

From Canada came officials of the Air Cadet League and high-ranking officers of the Royal Canadian Air Force, including Air Vice Marshals C. R. Slemon and E. E. Middleton. The visitors from Canada, with whom the National Executive Board has been coordinating activities of CAP and the Air Cadet League, expressed great appreciation to General Beau for asking them to attend conferences of the wing commanders and the Congressional Dinner.

Promotions—Three wing commanders were named recently in California, Illinois and Indiana, and five promotions, from lieutenant colonel to colonel, were announced at National Headquarters. California's new wing commander, who was promoted to colonel at the time of his appointment, is Colonel Howard B. Freeman. Lieutenant Colonel Charles Richardson, Jr., was named wing commander in Illinois, and Lieutenant Colonel Walter B. Smith, was made commanding officer of the Indiana Wing.

Promotions to Colonel were announced for Allan U. Bevier, Maryland Wing Commander; Kilbourne L. House, New Mexico Wing Commander; William M. Joy, Michigan Wing Commander; Thomas E. Knight, Wyoming Wing Commander. and Melvin E. Tyrrell, National Capital Wing Commander.

Observers—Alerted by advance weather data and flood stage advances by the Corps of Engineers, the Civil Air Patrol units in flood-endangered areas kept "on top of" the flooding conditions for the engineers, furnishing them with direct intelligence on conditions as observed from their low-flying light aircraft. Few really dangerous floods developed but CAP personnel acquitted themselves with honor and many new units received valuable training in communications, observing and reporting.

Compliments—The commanding officer of Squadron 546-H, Beckley, West Va., received letters of appreciation for the excellent guarding by that squadron of downed aircraft. The guard was maintained day and night under adverse weather conditions and aided materially in preserving the wreckage so that a complete investigation could be made by Aviation Safety Agents.

The note of thanks to the squadron pointed out once again the importance of maintaining downed aircraft intact so that inspectors and investigators can make a full examination.

News From Here and There—The 9th New York Group (Westchester) CAP has been operating a full schedule. Recently six Civil Air Patrol officers and their planes took part in a search for six Yonkers, N. Y., boys. The boys rented a rowboat for a fishing expedition in Long Island Sound, and never returned. Their overturned rowboat was discovered some 12 hours after the boys set out, but as yet no trace of the youngsters has been found.

Also recently, members of the Westchester CAP flew in ceremony over the hills and lakes of northern Westchester to scatter ashes of Alfred Borden, for many years a member of CAP, who passed away March 18. Mr. Borden, seventy-three years old, had made this request of his CAP unit shortly before he passed on.

The Shawnee, Oklahoma, CAP Squadron is producing an Air Fair and Industrial Exposition to acquaint people with safety, comfort and speed of air travel. There will be no "death-defying races." Congrats to Shawnee CAP.

NEW YORK GROUP 9, Civil Air Patrol, keeps mobile radar equipment at Westchester County Airport. During winter truck *(left)* was used to remove snow from runways. In addition equipment provides emergency field lighting, and is source of great interest to airport visitors

PIPER-STINSON '49

The Most Thoroughly-proved Four-passenger Plane

Try to beat the Piper-Stinson '49 for comfort, all-around performance, styling and ease of flying. Here's a plane so nice to fly, so tough, so rugged that more people have bought Stinsons since the war than any other 4-place aircraft.

No other plane in its class enjoys the advantage of improvements and refinements incorporated from the experience of more than *five thousand* previous models.

Step up to a Stinson—thoroughly proved by millions of hours of flight, carefully engineered for maximum all-around performance and sturdily constructed for low-cost maintenance.

There'll Always be a Stinson

24 years ago Eddie Stinson made personal airplane history by building his first *Detroiter* with a cabin, brakes and starter. Ever since, Stinson has set the pace for quality, performance, and comfort.

Features of the Stinson have always included honest flight characteristics, rugged, reliable construction and luxurious styling.

Now Stinson has become part of Piper Aircraft and we're both proud of and impressed with our responsibility to uphold in the years to come the reputation that is Stinson's. At this very moment plans are being made for exciting, new Stinson models which will do full justice to the respected name of Stinson and which will bring new meaning to personal and executive aircraft utility.

— • —

Completely equipped the Piper-Stinson '49 sells for $6484. See your nearest Piper-Stinson dealer for more details or write the factory for illustrated brochure, c/o Dept. 7-SK.

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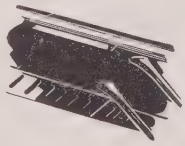
division of
PIPER AIRCRAFT CORP.
LOCK HAVEN, PENNA.

Stinson has out-sold all other four-place planes . . . Here's why:



WING SLOTS. The Piper-Stinson '49 is the only plane in its class with wing slots—one reason why the Piper-Stinson is virtually stall-proof. Insurance company figures give Stinson a top place in safety records.

EASIEST TO FLY. The Piper-Stinson's large, aerodynamically-correct fin, generous dihedral angle and adjustable rudder trim tab give the Piper-Stinson unmatched stability for hands-off flight even in rough air.

STATION WAGON STYLING. The Piper-Stinson '49 has been designed for both smart appearance and maximum utility. Rear seat is quickly removable, cargo straps are standard. Station wagon panelling takes hard abuse.

ROOM FOR FOUR big people and plenty of baggage too in large compartment. Scientifically designed seats, sound-proofing and refinement in every detail assure maximum luxury and comfort on long flights.

ROUGH FIELDS it likes! Farmers, ranchers, charter operators like the rugged, trouble-free landing gear for off-airport landings. And Piper-Stinson's type of construction is simpler to repair, requires minimum upkeep.

Is It Safe to Fly

(Continued from page 15)

personal-plane owners do little to present their side of the story. Newspaper and magazine articles which reveal personal flying in distorted and unfavorable perspective often go unanswered or, if attempts are made to answer them, the answers seldom present reliable statistics from which the reader can judge the correctness of the views expressed.

Failure to present a factual picture of personal flying to the public has resulted in many misconceptions and false judgments. The purpose of this article is to correct those misconceptions by citing facts instead of mere expressions of opinion.

The alarm expressed over the increase in personal flying accidents has given the public the impression that the number has increased out of proportion to the increase in the number of airplanes and pilots. Belief that personal flying has made little progress toward increased safety is prevalent, even among people who are usually well informed. The impression that personal flying safety has not materially increased is wholly erroneous.

Personal flying has come a long way since 1940. Aircraft registrations have increased from 17,928 in 1940 to 95,994 on December 31, 1948. Of the 1948 total, 93,609 are personal-type aircraft -- an increase of 450 per cent. Pilot registrations, exclusive of airline pilots but including student pilots, rose from 62,348 to 715,541—an increase of 1048 per cent.

During the same period, non-airline accidents rose from 3,471 to 7,800—an increase of 125 per cent. If personal-flying accidents had kept pace with the increase in aircraft registrations, there would have been 15,600 accidents in 1948, double the 7,800 which actually occurred. Similarly, if the accident rate had kept pace with the increase in pilot registrations, there would have been 36,376 accidents during 1948. Instead, only 7,800 were reported.

Therefore, if you own an airplane in 1949, you are twice as safe from accidents as you were in 1940, if calculated on the basis of the increase in aircraft registrations, and over four times as safe based on pilot registrations.

Another misconception is the public belief that in the event an accident occurs the chances of escape without injuries are extremely small. On the contrary, 84 per cent of the accidents in 1948 involved minor injury or no injuries at all. It is doubtful whether the personal automobile can show a better record.

The third misconception is the belief that many of the accidents result from violations of the detailed and very strict Civil Air Regulations. The Civil Aeronautics Board which records and tabulates accident reports, disclosed that during 1947 violations figured in only 10 per cent of the accidents reported. There were probably many violations that were not reported but since they did not result in accidents they are no more susceptible to calculations than the violations of automobile drivers who ran red traffic lights when no cars were in sight.

In a recent issue of a magazine of national circulation it was stated that according to an acknowledged expert on the subject "one out of 85 private planes has a fatal accident every year." *Report of accidents filed with the Civil Aeronautics Board disclose this statement to be untrue!* Only *one* out of 135 airplanes was involved in a fatal accident during 1948 and the rate has not been below *one* out of 107 since 1940!

The anonymous source of information also stated that "this class of flying would not stand much chance of survival—if there were as many personal aircraft as automobiles, we would have about three hundred thousand fatal accidents and kill five hundred thousand people." This statement creates a completely distorted impression in the mind of the reader because it fails to state the safety problem in its true perspective.

In the first place, no adequately informed person expects or even hopes that the number of personal airplanes, as they have been designed and developed to date, will ever approach remotely the number of automobiles in use today. The most optimistic predictions have set the maximum at 500,000 by 1955, but at the rate of manufacture and buyer demand during 1948 it will take 58 years to reach that estimate. Manufacturers are conservatively estimating that 8,000 personal-type aircraft will meet the demand for 1949 and present economic outlook does not point to a substantial increase in 1950.

Therefore, any comparison based on the 34 million cars registered in 1946 completely disregards the character and utility of existing personal-type aircraft and the economic factors which make aircraft ownership possible. Existing aircraft total less than 3 per cent of that number. Radical changes in design and performance characteristics of the personal-type airplane must come before even 10 per cent of that figure can be attained.

Another misleading statement was that "most life-insurance policies do not pay off on double-indemnity clauses if death occurs by accident to a plane other than a scheduled airliner. In other words, from the actuary's cold but accurate point of view, getting killed in private flying is not precisely accidental."

This statement is only half true. That the policy does not pay double indemnity for accidental death in a private airplane is true, but the reason is not because the death is not considered accidental. It is because the policies were issued without calculating a rate for double indemnity for death from a personal airplane accident and the rate was not included in the premium charged. A special policy has been available for several years covering death or dismemberment from any kind of airplane accident—airline or personal plane—at the rate of $5.00 per $1,000 per year. This is the same rate set for most automobile policies providing similar insurance against death from an automobile accident.

The article stated further "for safety the private-plane record has never approached that of the automobile." A comparison of the records of the private airplane and the automobile discloses some achievements by the private-plane operator.

In 1946, the last year for which automobile registrations and accident statistics are at hand, there were 34 million registered automobiles operated by an estimated 68 million drivers. There were 34,000 persons killed—one for every 2,000 drivers. In 1948 there were an estimated 715,000 pilots of personal aircraft and 1,097 fatalities occurred—one fatality for every 661 pilots.

Further reference was made to the urg

(Continued on page 51)

Forty Minutes by Plane

Forty flying mins from L.A., at Victorville, Calif., is Mac Dude Ranch that caters to flying guests. Recent visitors, shown here with Ranch owner "Mac" McCarthy (center), were (l. to r.) "Red" McCarthy, Mrs. O. Haupt, Mrs. J. F. Henry, Mr. Ollie Haupt of Amer. Swimming Pool Co., and J. F. Henry, Publisher of SKYWAYS.

FASCINATING WORK RICH REWARDS IN AERONAUTICAL ENGINEERING

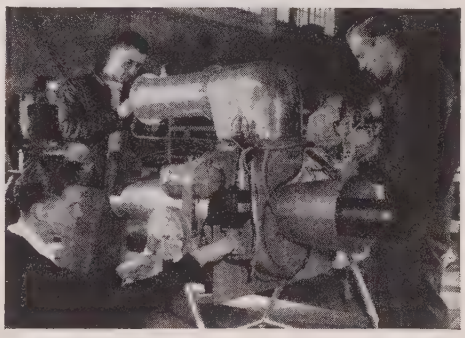
Right in this magazine, and in your daily newspaper, you see unfolding the swift, spectacular progress of *Aviation*—sensational new speed records ...ever-expanding, world-wide commercial airlines...spectacular new military aircraft. Right before your eyes are these thrilling achievements of *Aeronautical Engineers*—swifter, more powerful, more efficient planes ...performing ever more amazing feats.

Back of the countless new aircraft and new achievements yet to come, there must be trained engineers performing their fascinating duties, and enjoying the rich rewards of success, personal achievement, and the thrill of contributing to the great *Air Age.*

Here is a ringing challenge to the young man of imagination and ambition. Here is a career field where your talents—whether creative or practical—can have full play. Here is the ideal combination of security, unlimited opportunity, interesting work, and good earnings.

BIG JOB for engineers was inspection of completed 57-foot-high tail fin on Air Force's XC-99 Consolidated Vultee transport, world's largest land plane ...an example of the interesting and varied duties performed by aeronautical engineers.

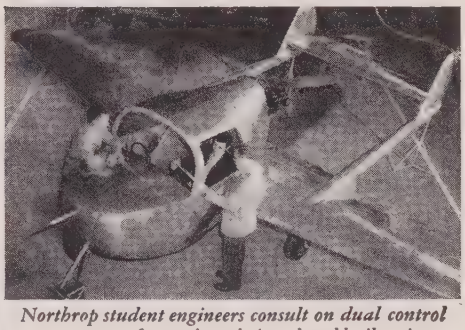
Models and contestants in one of the frequent meets held by Northrop Model Club. Through model building, students express the expanding knowledge of aircraft design and construction acquired during their aeronautical engineering training.



As a practical training project, Northrop engineering students developed this lightweight turbojet aircraft engine by adapting a fighter plane turbosupercharger, the students themselves designing and building the combustion chamber, ducts, tail pipes, and electric controls.

NORTHROP TRAINING HAS WON CHOICE JOBS FOR GRADUATES

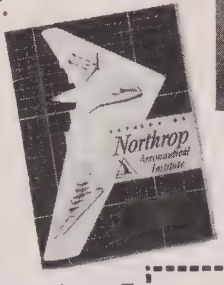
Equipping you—in knowledge, skill, and initiative—to make the most of the magnificent opportunites in Aeronautical Engineering, is the objective of *Northrop* training. Here at Northrop—the birthplace of some of the most important achievements in *Aviation*—you gain the priceless advantages of practical training in an actual industry environment. The record of *Northrop* graduates—in winning choice starting jobs and early advancement to important assignments—*proves* the opportunity for YOU.



Northrop student engineers consult on dual control arrangement for student-designed and built private plane. Complete metal mock-up shown here was fabricated and assembled by students as part of practical training project.

GET YOUR COPY OF THIS CATALOG

Here is detailed information on opportunities in *Aviation*... and a complete description of *Northrop's* 2-year *Aeronautical Engineering* course. This big, beautifully printed booklet contains many interesting photographs of Northrop planes and plant scenes. Send coupon for your free copy.



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Club Clipper

(Continued from page 18)

other four-placer, costing nearly four times the price of the *Clipper,* came sneaking across the fence with less than half the altitude.

Unstable air with billowy cumulus clouds stacked in against the Sierra Madre Mountains gave us a good chance to check the *Clipper's* flight characteristics in choppy air. Since the ship was brand new, the controls were naturally stiff, but the little plane handled better than any *Cub* that this reporter has yet flown. With its short-coupled dimensions, it turns fast, rolls fast and plows through rough air like a much heavier airplane than its 850-pound empty weight.

Wing loading on this ship is high for a *Cub,* 11.2 pounds per square foot of wing area, but that is still much less than the 15.5-pound loading of the larger Piper Stinson. This higher wing loading is a decided improvement on landings, as we later found out.

After two unsuccessful attempts to sneak into Monrovia Airport under the low-hanging clouds, we turned back to land at the East Los Angeles Airport, and telephoned the girls to meet us there.

While waiting for our passengers to arrive, we took flight instructor Dan January and two of the biggest mechanics in sight up for a ride. What better way to check the full-load flight characteristics of the airplane?

Inadvertently this load exceeded slightly the gross weight placard on the *Clipper.* With planes of the utility category where fuel, passengers, cargo and baggage are lumped together to total a given weight, accidental overloading might be prevented by putting a notice on the instrument panel giving the allowable passenger and cargo weight with a pilot and full gas tanks. It is easy to add the totals incorrectly, as we did, and come out with an overloaded airplane. Our full tanks with 30 gallons of gas would total 180 pounds. Mr. January weighed another 180. Our other two passengers averaged 165 pounds each. Pilot weight was 150 and there was 30 pounds of camera equipment in the baggage compartment. That's 870 pounds less probably 20 pounds of fuel that had already been burned out. Our overload was roughly 50 pounds, but the 850-pound figure was the one we had remembered for payload, not weight empty.

Anyhow, we found the *Clipper* would fly very nicely with a 50-pound overload. Against a quartering headwind of about 15 mph. we took 16½ seconds and only a fraction of the runway in getting into the air. Our rate of climb was average for two-place trainers.

Since it was getting fairly late in the afternoon—we'd waited nearly two hours for the weather to break at Long Beach—we had time for only two landings with our extra-full load before picking up the remainder of our family. All three of the passengers aboard the little *Clipper* were more than satisfied with the plane's performance.

"It's going to be plenty tough to sell two-place planes with this ship on the market for about the same money," said one of our passengers.

The most deceptive thing about this little plane is its roomy interior with such a compact exterior. The front seat is 39 inches wide while the rear seat is only two inches narrower. There was room enough for a small zipper bag on the front seat between the passengers without crowding. A soft bag of this type, incidentally, makes an excellent arm rest as well as making the throttle easier to reach.

The front seat is adjustable forward and back four inches. This sliding seat is controlled by a button between the pilots just under the edge of the seat.

The baggage compartment is back of the quickly removable rear seat. As a pint-sized air freighter, the *Clipper's* rear seat can be removed easily. No bolts or screws are required to convert the back seat into cargo space and the rear, (left) door is flush with the floor for easy loading.

We squeezed overnight cases plus the little youngster's necessary equipment into the baggage compartment, climbed in and taxied down for take-off.

Straight-ahead visibility on the ground is good and there is no need to "S" to see what's coming up ahead. Passengers riding in the back seat report better-than-average visibility and comfort, even though the front seat was slid aft as far as it would travel.

There's not much to check on the *Clipper* before take-off. Parking brakes will hold the ship easily during the simple engine run-up and there is no need to keep toe pressure on the hydraulic brakes. The parking brake button is located directly in front of the pilot between the carburetor heat and the mixture controls. All three knobs are identical and there is no safety lock on the mixture control. Granted that a pilot should not make the mistake of pulling out the mixture control when reaching for his carburetor heat before coming in for a landing, nevertheless, this error has been made repeatedly. Why not use a locking safety of some type on the mixture button?

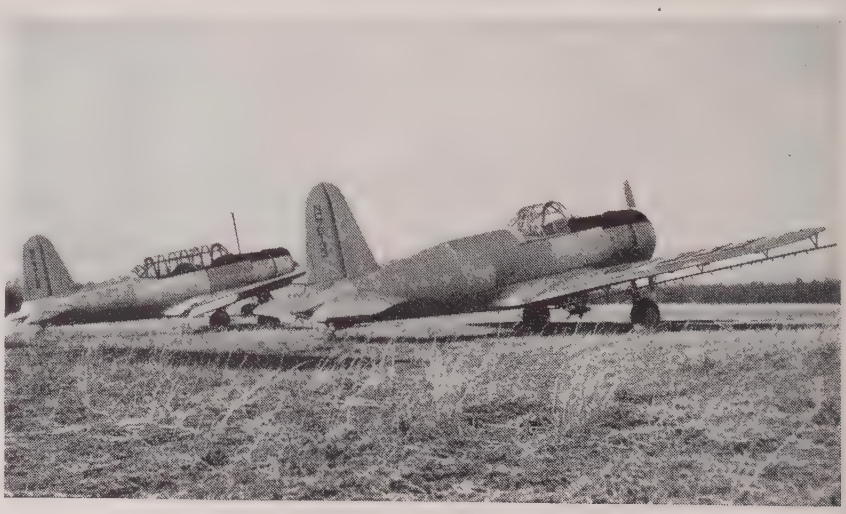
The few engine instruments: oil temperature and pressure, tachometer and ammeter are located just to the left of the throttle. A Model "A" Ford-type ignition switch is placed directly below the throttle while another Model "A" reminder is found in the gas gauge on the 12-gallon tank located under the dashboard. A selector valve will draw gas from this fuselage tank or from the 18-gallon tank built into the left wing. There is no smoking permitted in the cabin, due largely to this gas tank behind the firewall. A distinct improvement would be to place this tank in the right wing, not only from the standpoint of passenger comfort but to make the airplane trim-out better in flight. With the *Clipper's* present two-tank arrangement, the wing tank must be drained first to eliminate a wing-heavy condition.

The engine installation is similar to the Piper *Family Cruiser,* (SKYWAYS' pilot report, October 1948) with 115 horsepower coming from a four-cylinder Lycoming engine. This is the same 100-hp engine used on the older *Cub Cruiser* but 15 additional horsepower have been developed by the ram-air scoop on the carburetor intake and a "cross-over" exhaust system. This exhaust system takes gasses from the right front cylinder across under the engine to connect with the exhaust of the left front cylinder. Engineers say that seven additional horsepower are obtained from "more effective scavenging of exhaust gasses." A muffler is installed as standard equipment.

The dual control sticks are semi-circular in shape, making it possible for a woman in skirts to fly the *Clipper* without being embarrassed. Dual rudder pedals are installed with very efficient toe brakes on the left side only. The righthand stick can be removed.

The way we flew it, it was 108 miles along the Pacific coastline from the East Los Angeles Airport to Santa Barbara's spacious ex-Marine Goleta Airport. Taking into consideration a brisk 20- to 25-mph headwind and several small detours around low-hanging clouds, our flight time of an hour and 16 minutes from take-off to landing wasn't bad at all. Piper's advertised

(Continued on page 48)



EVER SEE a single-place BT-13? Ken Tyler of Long Island, owner of several Vultee "Vibrators", is busy these days converting them to liquid spray airplanes. Rear seat holds 125-gal tank. Note difference in "new" *(right)* and old ship

Some Call it War!

(Continued from page 27)

Russian zone of Germany on our way to Tempelhof in Berlin.

Like the other C-54's, just behind and just ahead of us, we were carrying every pound of food we could possibly carry. To get aboard, I had to climb over 10 tons of flour sacks piled one against the other on the floor of the plane. They were lashed down so the weight would not shift in the air or on landing.

The take-off had originally been set for 8 A. M. but the typically German winter weather and fog had closed down all early morning operations. We hadn't been able to get off until 11, to take our place in the air-borne assembly line that keeps 2,200,000 Berliners alive on an "island" deep inside the Russian zone.

It was the day before Christmas, the beginning of the seventh month of the airlift to Berlin. A jumble of thoughts ran through my head. I recalled the headlines of a year ago when the Russians had closed all roads into Berlin . . . and brought the Airlift to life. I remembered General Lucius Clay's original estimate that 700 tons a day would be necessary to sustain life in the German capital . . . and how this requirement had grown, like Topsy, to 5,000 and more tons a day. I recalled the Air Force's accounting that each ton of food, fuel and medicine cost $100 to haul to Berlin . . . and how the whole operation could easily cost the U. S. taxpayer a billion dollars a year. And I knew, too, there was another cost to the Lift that no American could ever figure in dollars and cents. Nearly two score pilots and aircrewmen have lost their lives flying this route . . . and the gruelling long hours, monotonous routine and the terrific tension day after day had taken years from hundreds of other kids.

These were the things I was thinking about as the pilot suggested I clamp on the radio earphones and listen as we were brought down through the thickening fog to Tempelhof Airport in Berlin.

It had been an exciting ride from Wiesbaden. The day was dreary and cold. A low hanging fog had blotted out the sun. But soon after we left the Wiesbaden runway and started to climb upward, we pierced the clouds and broke into the bright sunlight. Reaching 6500 feet we turned toward Berlin . . . and set the airspeed at 170 mph.

This was an old routine to our pilots. The route, which included two 90-degree turns and a half-swing-left before we reached the last and longer leg into Berlin, was as familiar to them as the hallway is to you back home. This was their 50th Airlift hop. For the Flight Engineer, an Irish lad from far-off California, this was the start of his 100th round trip to Berlin.

The town of Darmstadt passed beneath us . . . then Schrollkruppen . . . and then we were over the Fulda beacon. I looked at the map spread out on my knees . . . the air corridors on it were marked in heavy crayon. I located Fulda and noted it was just outside the Russian zone.

"How long before we move into the corridor and the Russian zone?" I asked.

"It'll be just a few minutes now," the captain answered.

And in a little more than five minutes, he was pointing downward. "This is the start of the Russian zone and the corridor," he said. There was little difference in appearance to an ordinary observer like myself. Quiet little towns . . . snow capped mountains . . . well-kept forests . . . they were all there. It was 12:15 P. M. here in Germany over the Soviet zone. Back in New York millions were still asleep.

"Doesn't look like there's much doing down there," said the pilot. "But some days those Russians seem quite busy."

"A little way up the corridor," the captain matched his voice against the four-motored roar, "there's a Russian artillery range. We can often see them shooting over the hills. Up nearer Berlin there's a couple of anti-aircraft ranges. They hold drills every now and then."

"See many Russian planes?" I asked.

"In the two months we have been running this route we haven't seen many," the captain said. "Every so often you'll see a couple of Russian fighters off in the distance and several times we've had a *Yak,* come up and fly formation with us. They'd usually fly on our wing for about three minutes

(Continued on page 54)

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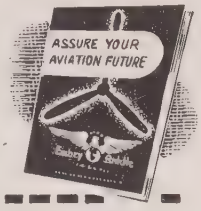

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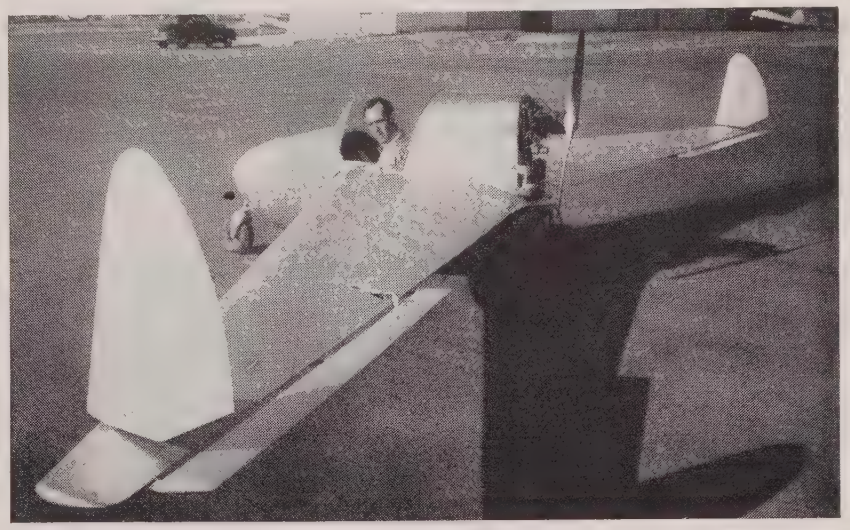

WEE WING is what builder Robt Sebring calls his plane. Designed after flying wing type and with swept-back wings, the little plastic ship weighs 150 pounds

Club Clipper

(Continued from page 46)

cruising speed of 112 mph seems quite accurate.

Since we didn't get into the air until after 5 P. M., it was getting quite dark by the time we reached Santa Barbara. The sun disappeared into the Pacific just after we passed over the Navy's guided missile experimental station at Point Mugu. N5215H was equipped with navigation lights and a single small red spotlight just to the left of the pilot's head. As extra equipment, this lighting set-up costs $50. The cockpit light is regulated by a switch located at the far left of the instrument panel and works surprisingly well even at that visually difficult just-before-dark period. However, a pilot should carry a flashlight if he is planning any night flying, since he cannot see his fuel gauges with this cockpit light.

The *Clipper* used for this SKYWAYS' article was equipped with a standard *Cub* Belmont two-way radio ($180 extra when installed at the factory) that was mounted just above the pilot's left knee. Smaller installations can be placed in the large glove compartment on the righthand side of the instrument panel. Headsets were installed with this radio since the noise level is only slightly lower than other *Cub* models.

As we passed over the brightly lighted outskirts of Santa Barbara, we called the Goleta tower for landing instructions.

"*Cub* one-five-How, this is Goleta tower. Land on the lighted runway, number two-five. Wind west two-zero with gusts to three-zero. You are cleared straight-in. Call one mile out."

The landing characteristics of this new *Cub Clipper* are the most agreeable surprise of this surprising little airplane. The main "beef" of the pilot who has flown heavy equipment and then climbed back into a *Cub* is its tendency to float half the length of the runway unless it is brought in on the verge of a stall.

Not so with the *Cub Clipper*. Bring it across the fence at an indicated 70 to 75 mph, ease back a little on the stick and it quickly loses speed. There's a little beep out of the stall warning indicator and you're on the ground at 50 mph.

A stall warning indicator is now installed on all *Cub* four-place planes. The factory feels that the additional $45 (paid by the customer) is more than a bargain in safety. Regardless of how a pilot may feel about this gadget, the *Cub* installation gives a minimum of annoyance. During an average landing, there is one short beep of not more than one second as the angle of attack of the wing passes through its critical position. If these electronic pilot-helpers will cut down on stall-spin accidents, more power to them.

The navigation lights glowed brightly on the paved taxi strip as we taxied up to the hangar. It was just that dark.

As in almost all new models, there are a few little things that could be added or changed for pilot comfort. However, considering the reasonable selling price of this airplane, the cost angle would have to be taken into consideration in any modifications.

One simple change to increase utility of this little *Clipper* would be to extend the cabin headliner back another seven inches over the top of the baggage compartment. Then put a hinged catch-all ledge for cameras, maps or in-flight lunches atop the baggage compartment, making it possible to reach into the baggage compartment in flight.

Similarly, it would be nice to have cloth pockets added to both sides of the front cockpit to hold maps, computers, gloves and headsets.

Cockpit ventilation is provided by two sliding plexiglas windows on the pilot's side. These are excellent for taking pictures from while in flight, but they are questionable for ventilation. If the window is merely cracked from the front edge, the air blast goes across the cockpit and hits the co-pilot. If it's clear open, there's too much air. Some sort of individual snap vent might be added with a minimum of expense to the builder.

Early the next morning, 180 planes from all over Southern California congregated at Santa Barbara for a breakfast flight. Many pilots visited the old Spanish Mission, but the majority loafed in the sunshine and watched the planes land and depart. The little *Clipper* was the main center of attention for the visiting pilots.

At midday, we piled aboard the *Clipper* and headed leisurely down the coastline. The prevailing west wind made up for the slow time we had recorded on our flight up the coast and we clocked over 140 mph ground speed between Santa Barbara and Ventura.

For a change of scenery and a bite of lunch, we landed at the 2800-foot downhill Conejo Valley Airport, midway between Ventura and Los Angeles on the inland route. There are towering oak trees bordering the approach end of the airport. A slight cross wind formed eddies between the hangars and the trees so we came in quite high on our final approach. It looked as though we would have to go around, but we followed Mr. Shackett's recommendation and hauled back on the stick, cutting our air speed 70 mph. While there are no flaps on the *Clipper*, we settled as fast as though there had been fully-extended drag flaps. At about a hundred feet, we eased off a little on the back pressure, picked up an extra 5 mph, flared out and landed in the first third of the runway.

Because of its chunky construction, the *Clipper* takes a little more altitude to regain lost flying speed than does its long-winged stablemate. This tendency to slow up quickly is also noticible during gliding turns where the nose must be dropped down to maintain a constant air speed.

After lunch, we climbed back into the little *Clipper* and headed on toward Los Angeles. The weather was made to order for the Chamber of Commerce and the air over Southern California was crowded with Sunday pilots.

It seemed a shame to return this neat little puddle jumper with a couple of hours of daylight remaining so we called the tower at the huge Los Angeles Municipal Airport for permission to land and see how the other half of the pilots, the airlines, were operating. The little *Clipper* may have looked out of place in the traffic pattern with the DC-6's, the "Connies" and the *Convairs*, but the tower gave us landing and taxi instructions just as though our four and a half passengers were as welcome as the Pan Am DC-4 from Mexico City that landed just ahead of us.

The flight-deck restaurant was crowded with gay spectators who looked down on our little *Clipper* with amusement. After talking with the shop foreman, we parked under the wing of a TWA *Constellation* for a couple of pictures of big versus little airplanes. Mechanics working on the airliner swarmed around the *Clipper*, asking the usual question: how much, how fast, how far and how heavy?

It was with no little regret that we finally returned the little *Cub Clipper* to the Piper dealer. Five hours of airport hopping had been a lot of fun. So many of the headaches common in the "light" airplane have been eliminated by clipping three feet off each wingtip of this new *Cub*.

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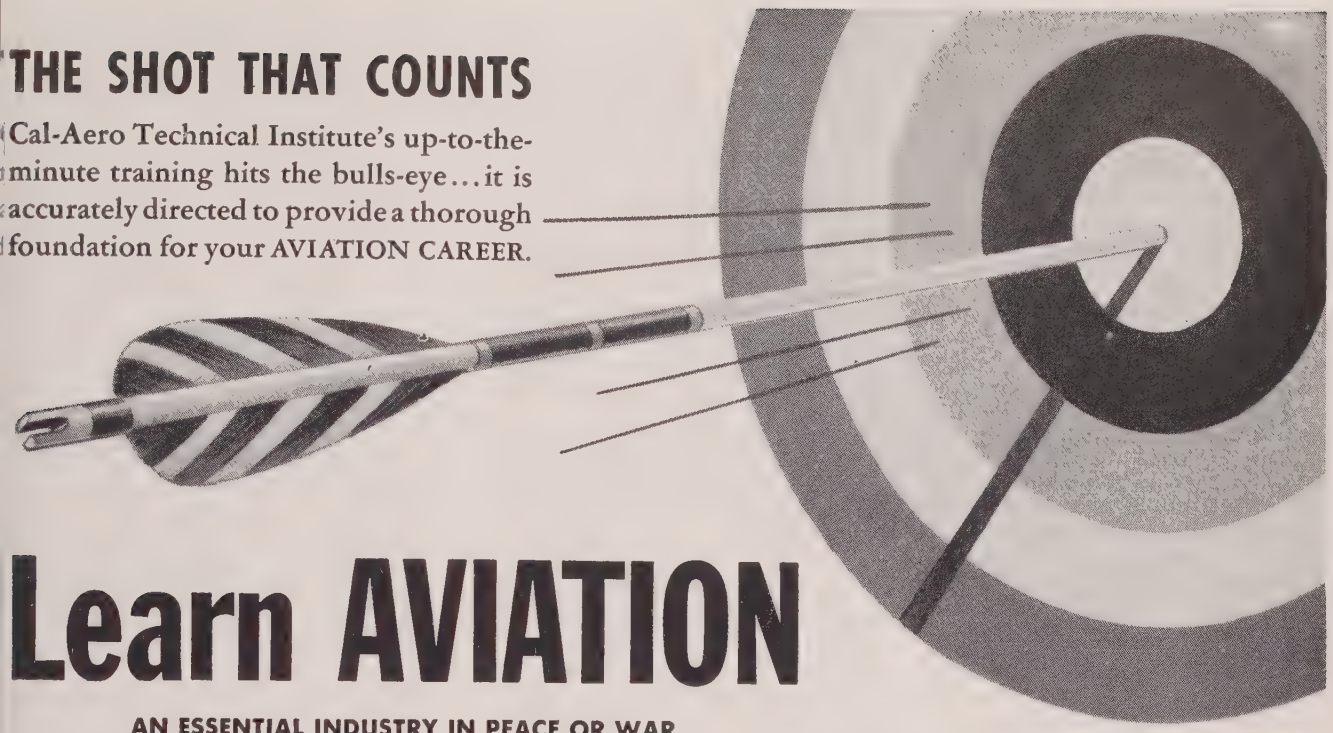

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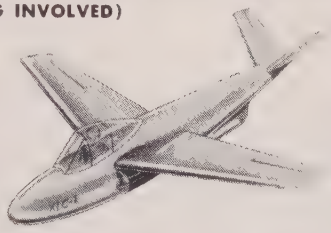

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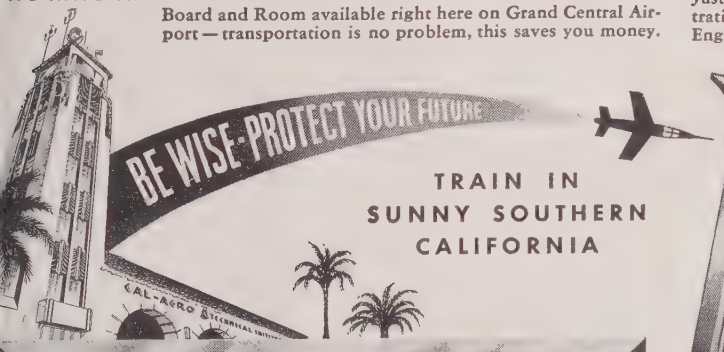

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S-7

Every Pilot's VHF

(Continued from page 21)

used on some sets. They say the pip on the cathode screen is sometimes as much as 8° wide which, obviously, would not make for accurate readings.

So much for the equipment. That's about all you need to know about it. Now to use it.

We wanted to fly from Westchester Airport to Wings Field at Philadelphia. Jim reminded me that the thing to do was to get a little altitude as soon as we left the pattern, for very high frequency waves follow straight lines. Because of this, you must have enough altitude to be sure there are no hills, buildings, or other obstruction between your antenna and the omni-range transmitter station. Incidentally, that 80° V antenna just happens to be the best shape for combining optimum 360° reception and minimum drag. At least the CAA says so, and they spent 18 months of intensive research to arrive at it. Jim says he can't see that the antenna slows the *Bonanza* down at all—which is par for the course because even a little drag is apt to show on such a clean, high-performance ship. The antenna is horizontal because the omni-range stations transmit only horizontal waves. For some reason or other, vertical waves are not to be trusted. The transmitter works on an orthodox stubby 24-inch whip antenna.

The first omni-range station on our course and within low-altitude range was Caldwell-Wright, across the Hudson River in New Jersey. Jim knew the station frequency so we didn't have to find it on an omni-range chart. (You get the charts from CAA in Washington.) Tuning the receiver to this frequency brought into play one of the functions of the *To-From Meter*. While you are out of tune with a station, the *"To-From"* needle stays in the center where there is a small red area. Then, as you tune to a station, the needle moves either toward *"To"* or *"From"* depending on where your *Course-Selector* dial is set. When the needle gets out of the red, you are satisfactorily tuned. Of course, the other tuning check is to listen for the da-dits. These will positively identify the station for you. Personally, I don't like the noise, so would prefer to do it visually.

Once the receiver was tuned to Caldwell-Wright, the next step was to center the *Left-Right* meter by turning the *Course-Selector* dial. Doing this showed me that the *Left-Right* meter will center on two settings of the *Course-Selector* dial, each the reciprocal of the other, one setting throwing the *"To-From"* needle to *"To"*, and the other to *"From"*. Usually, of course, you are interested in the *"To"* reading, *i. e.* you are more interested in where you are going than in where you've been. In my case, with the *To-From* meter showing *"To"* and the *Left-Right* meter centered, the *Course-Selector* dial read 235°. Presto! There was my course!

I started flying 235° by compass. Gradually the *Left-Right* meter needle began creeping off to the right which meant "Bear Right!" This simply showed that I was getting some wind from the right and was drifting off to the left. So I turned about 10° to the right, as the needle said I should, and flew a few seconds. Gradually the *Left-Right* needle crept back to center. Now, having been "warned" of a wind from the right, I flew 240° instead of 235°. I was still climbing and either due to increased wind velocity at higher altitude or insufficient correction in my heading—or both, the needle began to creep off to the right again. (That *L-R* meter just won't let you go wrong!) I steered even further right, got back on course, and corrected my heading again. This time to 245°. As I leveled off at 5,000 feet, this 245° heading proved to be good enough to keep the needle centered most of the time.

By now we had plenty of altitude to tune in the Philadelphia omni-range station. The *"To-From"* needle came well out of the red onto *"To"* and a check on the audio showed we were getting a strong signal over the 80-odd miles. I "worked" the *L-R* meter for a minute or two and established a corrected heading. There I was all set to ride that heading right into Philly with only an occasional glance at the *L-R* and never a worry about a check point. And it was hazy — check points would have been elusive.

But that was only the beginning. Our course to Philly happened to lie directly across Teterboro Airport and we were still north of it. Jim suggested we tune in Caldwell-Wright again, and on our *Course-Selector* dial set the bearing from that station to Teterboro, which happened to be 90°. In other words, while continuing to fly towards Philadelphia, which would take us over Teterboro, we drew an imaginary line from Caldwell-Wright through Teterboro. The centering of the *L-R* needle would tell us when we reached that line and, thus, were over Teterboro. This would give me a good check on the accuracy of the equipment by observing how close we might be to the Teterboro Airport when the *L-R* needle centered.

When the *L-R* needle was dead center, I looked out and down—but no airport. Before I could spoil the nicety of the timing by looking around too many seconds while moving nearly 3 miles per minute, Jim reached for the wheel and rolled us up on one wing. Sure enough, there was Teterboro directly under us, so much so that in a low-wing plane I couldn't see it in level flight! How accurate can a gadget be?

And that was no fluke. I tested it again by trying to hit Wings Field using nothing but omni-range. To do this, I first flew until we were directly over the Philly omni-range station. You know when you are getting close to a station by the increased action of the *L-R* needle. The needle moves off center more often and faster simply because, at close range, you don't have to be as many feet to one side of your course to be off a degree. And the gadget recognizes only degrees. But even then, the needle is well dampened so that it never gets too frisky to keep fairly well centered.

You know when you are in the area directly *over* the station by the action of the other needle—the *"To-From"* needle. As you go over the station, the *"T-F"* needle slides away from the *"To"*, bobbles back and forth over the red section a few seconds, then flops over to *"From"*.

In our case, as soon as the *"To-From"* bobbled we set the *Course-Selector* dial on the heading to Wings Field, 14 miles away, and slowed to 120 mph so that we could figure on just seven minutes to get there. Again I deliberately didn't navigate except by my compass heading, correcting as necessary to keep the *Left-Right* needle centered. Just short of seven minutes, I looked up over the nose and there it was—Wings Field, dead ahead. I stayed on course until we were right up to the airport boundary, and the intersection of the runways in the middle of the field was as close to being right over the prop hub as you'd ever hope to see it! If you've ever circled around in the haze looking for an airport like Wings (which is a grass field in a countryside of grass fields), you know how good it is to have that field show up right over the nose!

That's how simply, surely, and accurately this Narco rig works to tell you just where you are and which way to go. Of course there are refinements you'll learn and use as you go along. Some are fairly obvious: For example, if you fail to check your *Left-Right* meter over a long enough period and you've gotten off course enough to throw the needle clear over, you don't have to dog-leg back onto your original course or "beam". All you need do is turn your *Course-Selector* dial until your needle centers again and read off a new heading to fly, a new straight line from where you are to the station to which your receiver is tuned.

(Continued on page 52)

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Is It Safe to Fly

(Continued from page 44)

ht need to do something about the "low nd reckless" flyer who accounts for 50 to 0 per cent of private air fatalities." lthough 559 cases of reckless operation ere listed with the CAB as the primary contributing cause of accidents in 1946 nd 612 cases were reported with acci-ents in 1947, these cases comprised only .3 per cent of the total accidents reported 1946 and only 6.6 per cent in 1947. o doubt many cases of low and reckless ying which did not result in accidents ave been punished by the states without pports being filed with the CAB, but asmuch as no accident or injury occur-ed in these cases the percentage of acci-ents in which low and reckless flying a factor would not be changed thereby.

The tremendous progress which personal ying has made in achieving greater safety emphasized by further comparison of atistics of the automobile and the per-nal-type airplane.

In 1940, when 31 million automobiles ere registered, 32,245 persons were illed—an average of one person for every 65 cars. In the same year 180,000 pilots ere involved in 232 fatal accidents—one atal accident for every 775 pilots. By 1946 utomobile registrations totaled 34 million. During that year 33,700 persons were illed, one for every 1,020 cars, an increase safety from death by automobile of 5.7 er cent. Pilot registrations increased to 573,493 that year and 690 fatal accidents occurred—one fatal accident for every 831 pilots—an increase in safety from death by private airplane of 7.2 per cent. However, by the end of 1948 the number of pilots increased to 715,000 and fatal accidents totaled only 712, one for every 1,004 pilots, an increase in safety achieved of 31.4 per cent over 1940. *This is more than 3 times the improvement shown by the automobile driver!*

Considerable stress has been laid on the danger or injury to others occasioned by the personal plane. The number involved in such accidents is negligible. Only 16 persons were killed in 1947 and only 22 injured who were not aboard the aircraft. Of these, 20 walked into whirling propellers while the airplane was on the ground. Pictures of an airplane cracked up on a house-top represent a type of accident that only happens once in approximately 2,000 times. Cars crash into houses, too.

The answer to the question of achieving greater safety in the operation of personal aircraft does not lie in getting the "damn fools out of the air" so much as the installation of proper respect for the limitations of the airplane and its intended uses to the pilot. The airplane is no more intended for the performance of acrobatics or low flying than an automobile is intended for climbing curbs and telegraph poles. It is fundamentally a vehicle of transportation. Although under certain conditions improper use of the airplane can be indulged in without injury to the occupants or others. Such antics, however, if repeated, will result in tragedy sooner or later.

Sureness and swiftness of punishment for violating the basic rules of the air is essential. However, these rules should be simplified greatly so the average person can learn and understand them. In their present state, the average person cannot learn them, much less understand and obey them. There should be more courtesy to others in the air. Congested areas and low flying should be avoided whenever possible. Police officers should be notified in cases of low and reckless flying so prompt action can be taken against the offender. Airport managers and operators of flight schools should report infractions of rules immediately to the local police. This will do more to stop improper aircraft operation than anything else and it will add at least 10 per cent to the safety record of the personal airplane.

But getting back to the main question: "Is It Safe To Fly Your Own Airplane?." The answer is "yes!" It is four and one-half times as safe as it was in 1940. You can buy insurance for $5.00 per $1,000 per year. Your chances of being involved in an accident this year are *one* in 933, and your chances of serious or fatal injury are *one* in 78,372. By the exercise of good judgment in the operation of your airplane, your chances can be increased to one in a million. If you are too unlucky to be safe with these odds just call the undertaker and wait at home in a rocking chair for the "grim reaper." He will probably find you anyway.

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Every Pilot's VHF

(Continued from page 50)

As another example, your course doesn't *have* to be to a station. You can fly any course by taking *Course-Selector* readings on two stations, drawing those bearing lines on your chart to their intersection, and thus pin-pointing your position wherever you may be. Knowing where you are at any time is all you need to navigate *any* course. There are unquestionably many more wrinkles and short-cuts that will come to you as you use this Narco VHF and get more familiar with it.

The station facilities for omni-range are here, not just coming. Some 300 of the projected 400 or more stations are operating now, and all will be operative within the next few months. As it is, Jim Riddle reports that in a recent 18,000-mile nation-wide trip in his *Bonanza,* equipped with VHF only, he encountered no problems whatsoever through not having low-frequency equipment. He was never unable to pick up an omni-range station for more than a few minutes at a time, and then only when flying at minimum altitude. He could always pull up a few hundred feet and make contact again. Suppose you do lose contact with a station for a few minutes in the middle of a long hop. As I pointed out above, when you do make contact again, you're "on a beam," wherever you are. And even if you have wandered 10 or 20 miles off your original course, in the middle of a long hop the distance and time added by such an error are negligible.

Unless you're pinned down by minimum ceilings in the middle of a long jump, you needn't ever lose contact except in the event you are flying over one of the great desert areas where they haven't built omni-range stations. Through the great open spaces, such as those western deserts, the stations are spotted along the airways, and anywhere you have a normal reason to fly you'll find omni-range.

Personally, I don't think the loss of range at very low altitudes amounts to much anyhow. I made only one test of that, but it was pretty convincing. Winding up the return trip to Westchester County Airport, we came over the field at about 5,000 feet. We were getting a strong signal from Caldwell-Wright, and I suggested that we just keep letting down, still tuned to Caldwell-Wright, until we lost the signal. We let down, all right, but we *never* lost the signal. At about five or six hundred feet over the trees, with the meters still functioning, Jim asked "Had enough?" I had. I guess we'd have to fly right down a hollow to lose that signal . . . and we were separated from the transmitting station by about 30 miles of rolling country that included the Palisades along the Hudson, and a good many high buildings and steel towers. In any case, I was surprised to find how little altitude you need to pick up a station a good long way off. This is in large part due to the choice of spots for installing the omni-range stations. The CAA will go a good many miles from what might be considered the ideal geographical location, to gain altitude by getting up on a hill.

In my enthusiasm about the omni-range, I haven't said much about the Narco radio itself—except that anything you say about the Narco omni-range you say about the Narco receiver, for the receiver is, of course, the heart of the whole business. A few months ago you just couldn't get a VHF receiver for your lightplane, all of which meant you couldn't get omni-range unless you had plenty of money and connections as well as extra space and useful load in your plane. There were a lot of problems to be overcome in producing a receiver for private use, and most folks weren't too optimistic about an early solution of those difficulties. But Jim Riddle and a few other undaunted young men who had worked variously for Philco, Convair, and RCA thought they could do it. Right after the war they organized Narco for just that purpose. They did the trick, solving all the major problems.

For example, VHF, which is impervious to ordinary static, is highly susceptible to engine interference. Since most of the thousands of personal planes already operating do not have shielded ignition systems, it looked as if this number-one market might well be lost, for shielding an engine in the field is an expensive proposition. Narco took this problem in its stride by deciding that if the engine couldn't be shielded they would have to put the shielding in their radios. They did. In an unshielded plane, Narco audio reception is still not completely free from background noise, but it is quite usable and such installations are being made regularly. As far as omni-range is concerned, the only adverse effect is that maximum receiving range is reduced about 20 per cent. Since maximum range is generous, this reduction is not a serious consideration. Furthermore, in planes that do have shielded engines, necessary maintenance of shielded harnesses, which has always been very high, is reduced.

Narco reduced the weight of their equipment until they got the figure for receiver, transmitter, omni-range, and all accessories down to an amazing 15 pounds!

The *Left-Right* meter marvelously combines extreme sensitivity and accuracy with no tendency to get skittish. This is no accident, either. Narco went to instrument specialists, the Beede Instrument Co., up in New Hampshire, and had them make the meter to Narco's specs. They got a wonderful instrument and saved money.

Narco makes a lot of other proud claims which, thus far, seem to be backed up by evidence. For example, Riddle points out that the set in his *Bonanza* has been there, not shock-mounted except for the *L-R* meter in the shock-mounted *Bonanza* instrument panel, for 900 operational hours without needing maintenance. He even goes so far as always to turn on the set before starting the engine—and damaging sets by starting engines with radios on has been one of the pet gripes of radio owners for a long time. Narco is proud of its micrometer drive tuner for sharp tuning of the somewhat slippery VHF waves. Narco men tell you about the powerful automatic volume control which is what keeps your audio from fading out on you one time and blasting your head off another time. Then there are nice little things like having the receiver tuning dial well lighted with "army red" so that you can see it distinctly at night with no damage to your night vision.

Yes, there seems to be no doubt that Narco has come up with something unusually good from every angle. And the little savings here and there that Narco has patiently whittled out have made an extremely reasonable price tag possible. You can buy the whole works, including the omni-range equipment, for $575. And if you want only part of it to go with what you already have, or want to build up your equipment over a period of time, you can do that, too. The vibrator-type power pack lists at $99.50; the Receiver at $175.00; the Transmitter at $99.00 and the whole omni-range business at $200.00. This low price range is very important, for it is down to where Mister Average Plane Owner won't have to overstrain himself to reach it. And Mr. Owner, if you like to fly to go places, and like to do it with ease and complete confidence, when you've tried this Narco VHF omni-range rig—you're going to reach for it!

". . . overshot a runway, crashed a fence, hit a barn, then lost control!"

Cross Country Is Easy

(Continued from page 25)

ulver *Cadet* from the factory in Colum-
us, Ohio, to Kansas City. At the time I
ad a total of about 58 hours. On this
ip I think I learned the most important
ing about cross-country I ever learned—
sure your compass is accurate.

I took the precaution of having the
mpass on the *Cadet* swung just prior to
ke-off. It was a happy thought because
etween Columbus and Waterloo, Iowa, I
as forced down to the tree tops by low
ilings and was mighty glad to be able
trust my compass headings.

That trip taught me a good trick, too—
w to "slide in" to an airport when
sibility is low.

To do this, find on the chart some rail-
ad, river or highway, or some guide that
sses near the airport. Then leave your
tablished heading at an angle in order
intersect this guide, and follow it in to
e field. The important thing, of course,
to leave your original heading far
nough away from your destination to be
re that you intersect the guide path short
the field and fly into the field—not away
m it. This principle has been developed
a celestial navigation device, termed
ingle line of approach," using a line of
sition of the sun, advanced to intersect
e destination. The plane is diverted from
direct course to the destination to inter-
ct this advanced sun line at a point the
ilot knows will be short of his landing
ot. Then he turns on the sun line and
des in on this invisible guide line. The
avy, Pan American and the Air Force,
know, have used this device successfully
n long over-water hops with no inter-
diate landmarks.

You can do the same thing with a river
anything else that will lead you home.
he one prerequisite, of course, is a good
mpass so you won't stray too far, and
you can calculate more or less accu-
tely, the angle at which you will inter-
ct your new track. The angle at which
u divert from your original heading, and
w far in advance of the destination you
ave your track depends on how accurate
u know your navigation to be from
revious check points. If you're unsure,
u'll have to plan to make a fairly sharp
eviation from course, or start the devia-
on earlier so that you'll be sure which
ay to turn when you reach the guide path.

This is the kind of thing you're bound
pick up with increased experience. Try
some day, even if contact conditions are
erfect. You'll find it will only add a
inute or two to your flight plan, and
ay come in handy some time.

Personally, I rely almost completely on
dio aids to navigation in my cross-
untry trips. I am fortunate, however, in
aving in my own *Bonanza* (as well as in
e "Waikiki Beech"), all the radio equip-
ent a DC-6 carries. Every pilot can't
ave this equipment, obviously, but even
ith it, I continually check my position
sually. Radio can fail, but landmarks are
ell nigh indestructible.

A good rule to follow, as I see it, is to
ack your position constantly. If you lose
ur fix, return to the last checkpoint and

(Continued on page 55)

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They Called It War

(Continued from page 47)

and then peel off and swing away from us. Some of our guys have been buzzed by Russian planes, but it hasn't happened to us."

Our conversation swung to other things, and, in a few minutes, as seems to be a habit with Americans away from the States, it was centered on home . . . home as the pilots knew it.

"We both came over here on 45 days temporary duty. So did our flight engineer. That was 50 days ago. We were part of the Hawaii-Tokyo MATS run. We were just about ready to take off from Hawaii one morning when our orders were cancelled. 'You're going to Germany,' we were told, 'and you have two hours to get ready.' 'For how long,' we asked. 'Just 45 days temporary duty,' they said.

"So we dashed home, packed our things, said goodbye to our wives and children and told them not to worry because we'd soon be back in Hawaii. Then we dashed back to the airport and took off for Germany. It was a long trip . . . but a lot of us were flying the stuff into Berlin within six hours after we landed here.

"At first everything was fine. The work was tough, the hours long . . . but we kept telling ourselves we were going home soon. You see, we weren't the only guys pulled out on two hours notice. That happened most everywhere. A lot of our guys still have their wives in places like Tokyo, Panama and other forsaken spots. On two hours notice . . . and temporary duty orders . . . no one had a chance to move his wife and family. All we could do was to quickly kiss them 'goodbye' and get along. The wives and kids are still waiting.

"Sure, we would have liked to have brought our families along . . . or had them join us later. But that's impossible. Why? . . . When you're on temporary duty orders, as we are, you just can't bring your families.

"Well, as I said, our wives are still waiting . . . all over the globe. Now, don't think I'm just talking about the pilots. All of us guys, flight crewmen and the rest, are all practically in the same boat. We're here and our wives and kids are somewhere else . . . somewhere like Tokyo.

"Most of the guys will soon be or already are eligible to go home. But we don't know if or when we'll go."

The lieutenant interrupted:

"Damn near all the transport pilots in the Air Force are here now. Nearly all the C-54's we got are here, too. So there just isn't going to be enough replacements to go around. We're going to stay here . . . 45 days or no 45 days temporary duty. There's a job to be done and we look like the guys who'll have to do it."

Later on—in Berlin and at the other bases on the Airlift line—I heard similar talk. Pilots are usually talkative fellows and the pilots on the Airlift seem eager to talk about their temporary duty orders, the long hours and the awful weather around Berlin.

The captain explained the long hours in some detail.

"Our schedule calls for 12 hours flying, 12 hours off duty," he pointed out. "That's fine, but it seldom works out that way. Just like today. We were supposed to take off at 8. The weather was lousy, so we had to wait until nearly noon before we got off. We'll fly up to Berlin and unload, turn around, fly back, load and then fly back to Berlin. Then we'll come back and we'll be finished. But by that time we will have put in around 15 to 18 hours."

The lieutenant wanted to talk.

"You see, after we have worked the 18, it doesn't work out that we will be off 12. The schedule is a 24-hour job. If we work 18, then it's only six hours before we report back for another flight. If we take 15 or 18 hours to get the two loads into Berlin . . . well, that's just too bad for us. And six hours isn't much time when you gotta eat, shower, sleep and get ready to go out again."

"This is a pretty tough pace," the captain pointed out, "but the weather we've been hitting has really made it rougher. We have to be talked into Berlin practically every other trip. And that isn't easy work. Combine that with the long hours and you got a pretty tiring job."

"Home, at last . . . but where were you during that awful thunderstorm, dear?"

"I thought the automatic pilot was put in planes to relieve the pilots. Don't you use it?" I asked.

"We've been so tired here lately," the captain answered, "we've been afraid to use it. We figured if we put the automatic pilot on we might go to sleep . . . and fly right over Berlin into the Russian sector. We don't want that to happen. So we fly this job ourselves."

But there was no time for more talk now . . . we were 10 minutes out of Berlin . . . coming into Tempelhof.

The earphones crackled with static. Then the voice of our captain poured into my ears.

"This is Big Willy 9822 calling Tempelhof Tower."

There was talk about position and altitude. Tempelhof reported the weather bad, with ceiling down to about 100 feet and visibility exceedingly limited.

We went down to 2,000 feet. Quickly the windshield took on a coat of ice. We were evidently right smack in the middle of a low-hanging fog.

Tempelhof told us we were on the scope and our GCA (Ground Controlled Approach) controller would bring us in.

With that, the controller began talking in degrees, in headings, and rate of descent.

"Jig Saw now has you," the controller said in a calm, clear voice that inspired confidence.

"Take a heading of 36 degrees," Jig Saw called over, "Stay at 2,000 feet for the call when you pass over the final beacon."

It seemed only seconds before we were over the beacon and our pilot called in again.

"Now take a heading of 360," said the controller.

We obeyed his order.

"Steer to 090," he ordered. "Descend to 1500 feet."

Our captain repeated the orders . . . and followed with the familiar "Roger."

At 1500 feet we were still in the middle of a fog bank so thick that I couldn't see our wings, and ice continued to coat the windshield.

The orders began coming in again.

"Steer to 080. Descend to 1200 feet."

"Roger."

"After reaching 1200 feet put your gear down and lock it."

There was an odd sound as the wheels came out of their wells. Then they were locked . . . and our pilot called back to the controller.

Then new orders . . . and a new heading.

"You are now four and one-half miles from the end of the runway," the controller reported.

But from where I sat, listening to the conversation between the Tower and our plane, and looking out the icy window, there was nothing but fog.

"You are now four miles from touchdown," the controller cut in again. "You are a bit too much to the right. Steer left five degrees."

Here we were . . . four guys in a plane—in a fog—with 10 tons of flour—somewhere over Berlin—our future in the hands of a former Air Force pilot, now a controller, talking us down through the weather from his nest-like post atop Tempelhof's Tower.

We got a new heading.

Then . . .

"Start descending at the rate of 700 feet a minute."

Our captain obeyed . . . the plane pitched forward sharply, and I instinctively tightened my safety belt.

The fog swirled by . . . it seemed like it was going by at 1,000 miles an hour. Ahead and behind and on every side there was nothing but fog. I sneaked a quick glance at the pilot, copilot and flight engineer. My heart was banging away, but these three kids were cool and calm.

"You are now three miles from touchdown," we were told.

The controller reminded us of our heading, found we were a bit too far to the left, moved us back on the path . . . reminded us of our heading again . . . and watched our progress.

"You are lined up right for the runway," he said.

I couldn't ask the pilots, but I knew all kinds of thoughts were probably racing through their heads.

No doubt one quick thought went back

(Continued on page 58)

Cross Country Is Easy

(Continued from page 53)

art out again. I've always used that heory, and with it—pardon me while I nock on wood—I've never yet been lost.

A note in passing—pick railroads and vers as landmarks in preference to high-ays. Highways have been built so rapidly n many parts of the country that CAA harts haven't caught up to them. Rail-oads are less numerous and relatively ew have been built recently, so the possi-ility of picking the wrong one is negli-ible. It is also easier to distinguish a one-rack railroad from a double-track railroad, s identified on charts, than it is to decide etween highways designated as major or econdary. Probably the best fix you can et is a town identified by the junction f two railroads.

There is also the new CAA device for ndicating on charts, towns whose names ave been painted prominently on some tructure or other landmark in the town. irmarked towns are now identified by he underlining of their names.

Before starting a trip, I first check the veather, then while still on the ground, I re-compute my headings on the basis of wind-drift angle figured on the com-uter. I usually do this in the plane while varming up, or in a ready shack if there re pilots around that know the area and an give me information about it.

With this task done on the ground, icking up landmarks immediately after ecoming airborne is a cinch.

As for tools, I use only a computer and plotter. Any type of computer should be atisfactory, but get to know one well and tick to it. My plotter also has on it, a cale identical with the mileage scale on AA charts, making it handy in both etermining the course and in measuring istances. These, plus adequate charts, are ll the implements you need.

Except—I'll stress again—give yourself break by seeing to it that your compass as been accurately calibrated. Compass rouble is likely to be the greatest source f navigation error. Even with care, some ightplane compasses I have used have een off as much as 10 degrees. . . . ntil I got the new Sperry Gyrosyn com-ass, that is—but that's a different story.

It might be wise to underline here, too, he advisability of checking out with a veather forecaster wherever possible, or—f you're taking off from a small field—pending some small change to call the earest weather station. If you've got two-ay radio, you can get the weather from ny range station once you're airborne.

I have simplified flying for myself by oing immediately on the Automatic Direc-ion Finder as soon as I've taken a reading fter take-off. Generally, I simply follow his heading to my destination. If I'm oing to a small field not near a radio tation (CAA or standard broadcast) I go o the nearest station, and fly by land-narks the rest of the way.

Frankly, radio has spoiled me, and the est thing that could happen to private ying would be for radio to come down o the weight bracket and price bracket o fit all small planes.

It will never be a complete substitute

(Continued on page 63)

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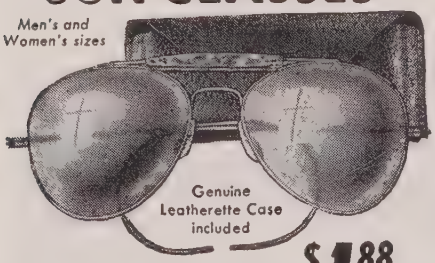

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Stop, Look and Relax

(Continued from page 33)

necessary checks when something upsets the smooth routine of flight. He already understands that there is a definite procedure to go through and because he is *mentally prepared* he goes through it almost automatically, without wasting time in skipping from doubt to hesitation. Thus he has valuable minutes to prepare himself for a landing *if* a landing becomes necessary.

This easy-going guy in the eagle's seat isn't necessarily one who has faced the same situation in the air before and he doesn't have to have hundreds of hours of flight time. When his engine begins sputtering, his eyes turn to his fuel pressure gauge, then his mixture control; he reaches for his carburetor-heat control to put it on and checks his fuel selector for position. If everything thus far is normal —fuel pressure mixture, heat and tank selector okay—he enriches his mixture slowly and then he cuts it back to lean as easily as he moved it up. If nothing seems to correct the condition and the engine is still acting up, he checks his mags. Then, if there is still no discernible reason for the engine's actions and there is insufficient power to continue the flight to the nearest airport, he looks around for the nearest and best open field for a landing, taking careful note of the wind direction. As he trims his craft for best glide speed he also prepares himself mentally so that when he does come down every action will give him a better than even chance for a completely successful forced landing.

What is it that makes this one pilot without too much flying experience the calm and sure person he is? His cockpit actions that appear so measured in time are actually almost automatic reflexes. He has a mental picture of the few things that he can do and has to do and because he is sure of these things he is completely relaxed. It sounds easy and it is, once the pilot has gone through a certain preparation, otherwise it becomes the toughest kind of flying possible. Panic comes when a person faces the unknown and mentally twists himself into a knot with questions about, "What do I do now, what can I do now? This is a mess—I'm lost!"

The whole business about how to cope with an unsettling incident in flight is actually taught by mechanical drill—one, two, three, four. The pilot has to practice going through each step until it becomes ingrained in his thinking and becomes an automatic reflex . . . and the best place to practice it is on the ground.

The cockpit check is one of the most neglected and most important parts of proper, safe flying. The pilot should be absolutely familiar with the instruments, controls and positions of every installation in his plane's cockpit, using a check list to relax the average pilot more than most of us realize. Unless he knows definitely that they may be wrong, he should also respect and believe all his instrument readings since they provide the clues to troubles. The completely trained pilot is one who can sit blindfolded in a plane and, without fumbling, reach and make the proper movement of every control necessary for flight. Then he must go beyond that and spend a couple of hours on the ground placing himself in each conceivable emergency that he might meet in the air and run through the logical order of measures to solve or counteract each one.

In the air, when he meets the trouble that was previously insulated, almost instantly a mental picture of the necessary procedures will run through his mind and as he goes through the steps his already conditioned reflexes will have sorted out all the possibilities and he will always be ready for whatever action is required next.

An airplane engine needs fuel, air and ignition in specific quantities. Shutting off or limiting any one of those factors will cause the engine to run rough, cut in and out or die completely. Mechanical defects in the engine equipment or propeller may cause similar symptoms that may or may not be overcome by corrective action on the part of the pilot. He has to know which instruments will give him the indications of specific troubles and which controls will counteract them in the cockpit or under the cowling or in the tanks.

DOCKING handle for seaplane has been devised by Fred Miller of Brooklyn Skyport. Made of aluminum and weighing a pound, handle for all-metal seaplanes will support entire weight of the aircraft. They will sell for $13

As an average pilot with about 4,500 hours of varied civilian and military flying, I have accumulated in my mind certain steps that I would go through (and have had to go through) in meeting different flight emergencies. They include precautions to avoid flight mishaps and also what to do when a situation gets beyond normal control.

As an illustration of how to avoid one inexcusable type of foul-up, it might be best for pilots to rehearse a definite method for switching fuel tanks. Always check the fuel quantity gauges before making the change to insure that the tank you're switching to has enough fuel in it. If possible, switch tanks while over or near an airport for maximum precautionary safety. Note your fuel pressure during a change and stand by on the wobble pump if your pressure drops during the changeover. Always land on the tank with the most fuel. It sounds simple, but 51 of the acci-

nts listed in the Weick report were due none-use or mis-use of the fuel selector lve.

Following are various types of flight *idents* and the procedural action to go rough to find and correct the cause, and hat to do if it cannot be overcome in ght. As an over-all caution, *don't build incident into an accident!*

A sudden and unusual noise in the gine section followed by a rough engine: Reduce power and head for the near- field; 2) check your instruments for indication of which system might be volved; 3) if the roughness is not severe, epare for a normal landing; 4) if the bration becomes severe, reduce power a minimum, but if the vibration gets to e point where it is threatening to dam- e the plane, cut the engine and pre- re for a power-off landing. Never cut e engine unless it becomes absolutely cessary, minimum power can prolong glide to enable the plane to reach an rport or a more dependable emergency nding area than might otherwise be ailable. Also, remember that you can't around again on a reduced power or wer-off landing and the first approach s to be in.

Propeller vibration: Reduce power, keep- g the airspeed at least 30 per cent above e normal stall speed and prepare for a nding in case the vibration is progressive.

Oil overheating in climb or on take-off: may be due to improper grade of oil, t enough airspeed or the cowl flaps may e closed. The condition is usually accom- anied by a drop in oil pressure. 1) crease speed and open cowl flaps; 2) if mperature doesn't drop and pressure esn't rise, return to the field at reduced wer and make a normal landing. Do t continue the flight if the condition rsists in spite of the corrective measures.

Oil overheating in flight: 1) If it con- stently increases and opening the cowl ps and increasing the airspeed by putting e plane into a slight diving attitude does t correct the condition, land at the near- t airport; 2) if the temperature rise and ll is intermittent, relax because it is prob- ly the instrument, but have it checked y a mechanic at the next airport stop.

Fuel quantity gauge drops faster than ormal: If you have no previous reason r not believing the gauge, your plane probably losing fuel in flight because leak in the tank system, or you may ve excessive fuel consumption. In any se, you should head for the nearest rport. Don't disregard a gauge without finite knowledge of a possible malfunc- on becaue the Weick report shows that 4 of his listed forced landings were due planes running out of fuel, while only 2 of the accidents were due to inopera- ve or inaccurate fuel gauges.

Carburetor icing: On planes without anifold pressure gauges, if the rpm starts opping off for no apparent reason and e engine begins running rough, the car- uretor may be icing up. Put the carbure- r heat on. If this does not clear up the ndition, try to get to the nearest landing ld and be prepared to make a power-off nding because on most lightplanes the gine may quit in 30 to 90 seconds after e icing condition begins affecting the gine rpm. The fact that the engine roughness and the rpm drop may be due to some other cause is no excuse for the pilot to ignore the probability of icing. He should take care that he is in a position to make a landing if necessary. Planes equipped with manifold pressure gauges will tip the pilot to icing conditions when, with airspeed and rpm still normal, the manifold pressure begins to drop perceptibly. One to two minutes should be enough to clear up the ice with heat, but if airspeed and rpm begin sagging, too, it's time to look around for a letdown.

Now we come to the critically important question of the type of landing to be made under upsetting conditions. Except for low-altitude emergencies, the conscientious pilot who follows the routines already noted will have plenty of time to prepare himself for what may come next —a partial power or no-power landing.

After having dealt with the flight trouble as best possible, the pilot must realize that he has done all that is within his limits and, if the trouble persists, he has to find a place to land. Here is where keeping relaxed comes to the fore. If a pilot hasn't wasted altitude trying to keep a faltering plane in the air long after his fix becomes obvious, he should have plenty of time left to take a quick look around in all directions for his best possible landing spot. That is, if no airport is in sight. Once he decides on his letdown he must make up his mind to stick to it. An important consideration is that the pilot should know at all times, no matter what type of plane he may be flying, the best power-on and power-off gliding speed of his aircraft since his rate of sink determines how much time he still has in the air and how far he can fly. Indecision is a main cause of landing accidents and only if the pilot sticks to his first decision can he apply himself to make the most of the area he has picked out.

The pilot must have estimated, before committing himself to the particular field, his approximate clear space for the landing, wind direction and possible obstacles in his landing path. Coming down, he should have his plane trimmed for best glide speed at a comfortable margin above normal stall speed. Dropping the nose to pick up extra speed during the glide is definitely *not* recommended as it wastes altitude needlessly when proper trim would achieve better results by giving a constant sinking speed to gauge the approach.

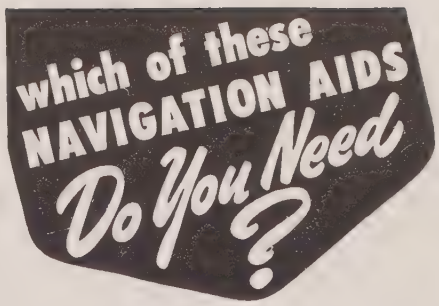
The actual landing should be made with the method the manufacturer advises for a particular type of plane and gear to get the shortest possible landing roll. If the plane has a retractable gear, the landing should be made with the gear up on doubtful surfaces to eliminate the possibility of somersaulting the plane.

The types of flight emergencies that directly affect landing techniques are as follows:

Engine sputters on and off on take-off: Keep flying straight out until there is enough altitude to make a safe, level turn to come back to the airport. Do not attempt to continue the flight unless there is a cockpit reason for the sputtering.

Engine quits completely on take-off: 1) Cut the ignition switch and master switch; 2) cut the mixture control; 3)

(Continued on page 59)



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In the August issue of SKYWAYS

SKYWAYS' test pilot puts the tiny Mooney single-seater through its paces . . . and comes away with a report on trim and fleet little single-placer with many uses.

They Called It War

(Continued from page 54)

to August 13, 1948 . . . sometimes labeled "Black Friday" . . . on Airlift records. It was a day just like this one. A low hanging fog . . . and then it began to rain so hard that you couldn't see the runway from the Tower. Just as this happened, 20 C-54's, loaded like ours, were on their way up the corridor to Tempelhof. They were flying at 170, as we were today, and were spaced three minutes apart.

Radar is wonderful for everything except heavy rain. Heavy rain is its master. So it wasn't but a few seconds before the controller found himself sitting on the hot seat. The C-54's were coming in too fast for him to "talk them down" . . . so he stacked them up. And nearly everything went wrong. It seemed as though all the pilots started asking for instructions at once. Then the controller tried to bring them down one by one. One *Skymaster* burst two tires when the brakes were applied to bring it to a stop short of danger; another overshot the field completely, crashed into a ditch and partly burned, and a third, coming down through the fog, landed on a runway under construction instead of the regular strip.

That was a day all pilots on the Lift will long remember. They talk about it morning, noon and night. And coming down through the fog and ice and the below-zero weather, as we were then, our crew, I knew, was thinking about it again.

And I know the captain and two kids up front in the cockpit were thinking about those apartment houses that rim the air field at Tempelhof.

Just where the planes let down through the treacherous, pea-soup fog that has become a familiar but not welcome visitor to Tempelhof, there are a couple of seven-story apartment houses. They were never big hazards to the German planes in Hitler's hey-day . . . because Tempelhof was mostly used as a fighter field. But to the Airlift planes these bombed-out apartments . . . now only a shell of their former selves . . . are a big danger. There they stand, looming up through the fogs, seemingly waiting to catch that plane that strays a bit off its final approach.

And there are other things to trouble the pilots as they let down through the fogs. There have been times when the C-54's, coming through on instruments, have somehow hit the same path head on —and only a quick maneuver has averted a crash. And there are always the Soviet airmen who like to swoop in and out of the area whenever they feel like it.

"You are now one mile from touchdown," the controller cut in again.

He checked our heading, gave us a corrected one, and checked us again.

"You're now a half mile from the end of the runway, everything is perfect."

Then, suddenly, out of the now thinning fog came the red lights outlining the main Tempelhof runway. "I have the runway in sight," our pilot reported.

We swung down past the apartment houses . . . the pilot straightened the plane and flared out for a perfect landing.

I listened to the pilot talking to the controller as we rolled down the runway.

"Nice talking," said the captain. "Thanks very much."

And behind us—just three or four minutes behind us—another C-54 was being "talked down" to Tempelhof.

A jeep with a huge "Follow Me" sign led us to the unloading space.

A half dozen C-54's were lined up along the line and a half dozen crews of Germans, most of them wearing the German army coats and hats you see so often in occupied Germany, were busy unloading their varied cargoes.

As soon as the plane stopped, our sergeant swung open the door and let down a tiny ladder. A big truck, filled with some dozen Germans, backed up against the door and before the pilots and I left the cockpit the flour sacks were already being taken off.

"Everything's timed here," the sergeant explained.

A snack wagon, manned by a couple of good-looking Berlin frauleins and well-stocked with sandwiches and coffee, was waiting for us when we came down the ladder to the ramp. The ham sandwiches and coffee cost us a dime apiece—in U. S. military scrip.

We hadn't taken more than a bite out of the sandwiches when a jeep rolled up with an operations officer and meteorologist to brief the pilots for the return trip to Wiesbaden. The pilots never strayed more than 20 feet from their planes when they were on the ground at Berlin, and in less than 30 minutes they were in the air again on their way back for another load.

This clock-like precision . . . which brought a plane into Berlin every three or four minutes of every hour, every day, seven days a week, and got them unloaded and off again in under 30 minutes didn't just happen. It was carefully planned. Every stage of the loading, unloading and flying operations had been subjected to stop-watch studies.

But these puppets were different . . . they did a lot of thinking. And they had straight - from - the - shoulder answers for questions like the one I asked just after we climbed into the plane for the return trip to Wiesbaden.

"I've asked a lot of questions today," I said, "but there's one that really has been troubling me. If you don't mind, I'd like to ask if you think we're in for a war."

"We don't mind," said the captain. "And we've got some answers, too. I'm no expert at this guessing business, but I'm figuring we'll be flying the Lift until summer . . . and from then . . . who knows?"

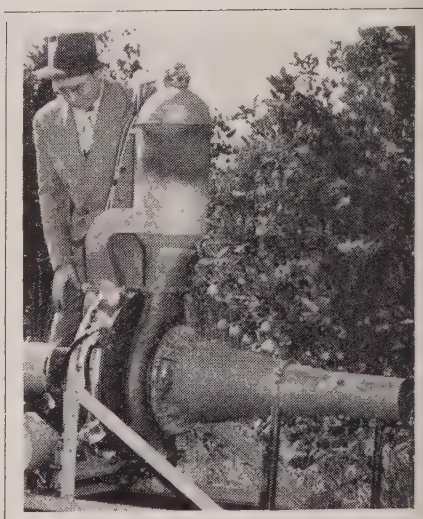
The lieutenant had a last word.

"As far as we're concerned, what's going on right now may be without shooting . . . but we call it war."

The pilot "revved" the motors. He called to the Tower. "This is Big Willy 9822 ready to taxi out for take-off to Wiesbaden."

The Tower gave us an okay and the big plane rolled out to the runway.

I took another look at the three kids sitting up there in the cockpit. They looked tired. There were deep lines around their eyes. But there were smiles on their dirty faces. Courage in their hearts. And skill in their hands and minds. They looked just like three kids . . . but they were truly men of whom all America could be proud.



SMUDGE POT that is jet propelled was originally a supercharger on a B-17

Big Wind Factory

(Continued from page 30)

feet with a passenger in less than eight minutes. Factory specifications put the absolute ceiling of this plane at 17,000 feet.

One day late this spring, Bob Symons and John MacDonald sat around the Bishop Airport, watching the lenticular clouds form. Flight conditions seemed too good to stay on the ground so they wheeled a single-engined Bellanca *Cruisair* out of the hangar, put two small walk-around oxygen bottles of 10 minute duration in the cabin and installed a barograph.

Using lenticular clouds to direct them to the areas of best up currents, they maintained a steady 2,000-foot-per-minute climb and began to take oxygen sparingly from their limited supply at 20,000 feet. At 28,000 feet, the 150-hp engine quit because of the rarefied air. Symons was able to maintain a 1,000-foot-per-minute climb for another two minutes. Rather than continue upward with their scanty oxygen supply, however, the pair leveled out and started down. A check on their barograph showed 30,700 feet.

And the recognized national lightplane altitude record is less than 24,000 feet!

To produce these phenomenal areas of rising air, winds of at least 25 mph must blow from the west across the High Sierras. While meteorological scientists disagree on the specific action of this wind, pilots flying in this area generally agree that the turbulent mixing zone as the air rushes down the lee slopes of the High Sierras is responsible for up-and-down currents as strong as any recorded in thunderstorms.

Pilots who have spent considerable time in and around these up-and-coming lenticular clouds agree that there is usually a "roll" cloud just downwind of the crest of the mountain and approximately over the base of the hill. This cloud is the center of a vortex of extreme rolling turbulence caused as the wind pours down over the lee side of the mountain to meet the churned-up air that is already there. Some

(Continued on page 60)

Stop, Look and Relax

(Continued from page 57)

urn the fuel selector to the "off" position;) if the plane has flaps, hit the flap utton or handle to "down" if they are n the "up" position, and give all your ttention to *landing under full control traight ahead.* No turn should be ttempted.

There is a vital difference in making an mergency landing with retractable gear. f the gear has already been raised in the revious case, the landing should be made vith the gear up if there is no chance of urning back to the runway. In all the ollowing instances, corrective action pplies similarly to all types of light air- raft and gear is mentioned only where retractable gear may be involved to hange the circumstances.

Missed approach: At least 90 per cent of he time the pilot should know at about 00 feet whether his approach is bad. While most pilots might not consider this ny danger the wrong recovery procedure as led to accidents. On a missed approach,) apply full throttle without fail, quickly, ut smoothly; 2) start the gear up; 3) get irspeed, not altitude, by going straight out nd do not attempt a turn; 4) trim for limb; 5) when the airspeed is 20 per ent or better over the craft's normal stall peed raise the flaps; 6) when the plane egains normal climb speed, retard the hrottle to normal climb power and then ome around in the pattern again.

Gusty wind landing conditions: To avoid last-minute approach stall due to wind usts, let the highest speed of the gusts be he controlling factor and fly the plane in t that many miles per hour above the tall speed. The plane may seem to be oming in hot, but don't cut power until ust before the plane touches down, other- vise in a wind change the bottom may rop out and leave you in accident-prone pproach stall. Make a wheel landing in onventional geared aircraft. Take-offs also ave to be measured against the highest ust velocity because gusts are combina- ions of high and low velocity air currents vith highly irregular motions forming up nd down drafts in eddy currents. On the inal approach there is usually not enough learance to give a pilot time to correct is angle of descent if the plane meets a own draft unless he has begun his final vith the added power to compensate for he drop in wind velocity that might be ncountered. Naturally, in this type of igher speed approach, try to touch down n the first quarter of the runway, espe- ially on short-field landings.

Another type of flight emergency is ound on retractable gear planes—the land- ng gear jammed in either the down or p position.

When the gear won't retract: 1) Check he circuit breaker or hydraulic pressure, depending on the type of system; 2) if the eason is not apparent there, don't use the mergency retraction system, since when he cause of the foul-up is unknown you may aggravate a mechanical difficulty that will prevent the eventual lowering of the gear; 3) return the switches to the "down"

(Continued on page 62)

Pilots, Plane Owners . . .

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7/49

Big Wind Factory

(Continued from page 58)

pilots report the turbulence in this mixing zone is equal to anything that a thunderstorm will offer.

The lenticular clouds are formed above this rolling air mass. Wind coming across the top of the peaks is deflected up-ward by this roll cloud, forming a thin, delicate lenticular cloud far above, and slightly downwind of the crest of the mountain. In an action similar to the waves and ripples in a mountain stream as the water swirls around a protruding rock, these waves will continue in decreasing intensity for many miles downwind of the ridges. Distance between these waves depends upon the height of the mountain and the velocity of the wind.

Between the lenticular clouds will be an area of extreme downdrafts.

However—and there's always a however where meteorology is concerned—these high lenticular clouds and the lower roll cloud may not be visible because of very dry air. If the wind is unusually moist, the whole area may be "socked in" and this phenomenon would be visible only by the action of instruments. The best of these lenticulars, usually used for record-breaking attempts, accompany a cold front. The frontal passage supplies the west wind and the mountains do the rest.

Almost unknown to pilots is the dangerous tendency of a conventional pressure altimeter to read too high in these areas of downdrafts near high mountains. Coupled with the already existing downwash of air and the natural tendency for wind to accelerate as it passes over the mountain crests, this set-up is doubly dangerous to a pilot flying on instruments.

In an exclusive statement to *SKYWAYS*, Professor Charles F. Brooks, Director of Harvard University's Blue Hill Meteorological Observatory expressed the belief that the Civil Aeronautics requirement of a 2,000-foot clearance above the ground is not enough in the strongest winds over the roughest terrain.

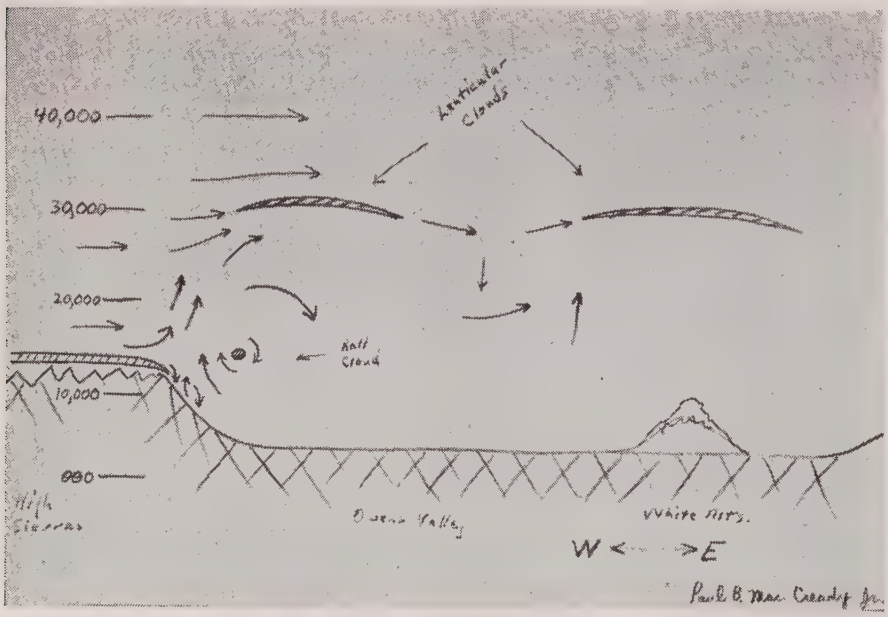
"Approaching a mountain from the lee side, while flying at a 'constant altitude' as shown on the altimeter, a plane will be descending at an increasing rate as it approaches the crest," said Professor Brooks. "Furthermore, as it nears the crest, the plane will be caught in the strong down pouring of wind on the lee side, so that before the pilot realizes it, the plane is losing even in apparent altitude (as seen on the altimeter). If the usually present strong turbulence then buffets the plane, throwing it temporarily out of control, a crash may be inevitable even though the plane may be approaching the crest at an altimeter height of 4,000 feet greater than the height of the mountain! This is perhaps the most extreme condition."

Observations made by Roland L. Ives on the lee side of Long's Peak in Colorado showed the pressure reduced some three inches of mercury by the action of the wind; that's equivalent to 3,000 feet on an aircraft altimeter!

"Nearby White Mountain," says Bob Symons, "is 14,242 feet high. One day I was flying a lightplane well down below the peak and my sensitive altimeter read over 15,000 feet. I've found that these localized low-pressure areas frequently make a 1200- to 1500-foot error on the low side here in the Bishop area."

As more and more rough-country flying is done by the airlines and military transports, these relatively unknown lenticular waves and frequent altimeter errors are under study by various organizations including the Air Force, the NACA, the U. S. Weather Bureau, and several universities.

Airline Captain Gil Sperry, now on a San Francisco, Reno and Spokane route, reports frequent lenticular cloud formations along his route. He says that high winds aloft are needed to form these clouds although there need be no wind on the surface. On one extremely rough day, he tells of having his fully-loaded DC-3 climb 1500 feet in 30 seconds with power off and the landing gear extended to help slow the plane down. At this time the wind at 12,000 feet was blowing 90 mph and cockpit instruments recorded 2½ to 3 g's.



DRAWING shows cross section of wind conditions on day Paul MacCready soared to 29,500 feet

Take the case of two "tired" PT-19's returning to the Los Angeles area from Bishop. One entered an area of rising air at 7,000 feet near Mojave. Without changing his throttle setting the pilot pulled back on the stick slightly to remain a little longer in the updraft. He soared to 11,500 feet without once making a turn to stay in the updraft. The other PT, three miles away, did not gain a foot of altitude.

A large part of the original research on these mysterious lenticular clouds has been done by glider pilots. Many early European motorless flight records were made in German Alps on what was termed a "Moatzgotl" (Foe's beard) condition, similar in most respects to the big winds found near Bishop in the High Sierras.

When Johnnie Robinson (SKYWAYS *February* 1947 *"Power Pilots Are Second Best"*) made his record-breaking 33,500-foot official flight this year, he naturally took off from the Bishop Airport. During this five-hour hop, he split the plexiglas canopy of his 11-year-old "Zanonia" sailplane when he hit it with his head in "the roughest air I've ever flown in." Headed west toward the High Sierras into the wind of over 120 mph at 22,000 feet, his canopy frosted over and he scraped a tiny hole in it with a business card so he could see out. After reaching his record altitude, he headed south and spun down through a small hole in the solid overcast from 20,000 feet—at five turns per one thousand feet—to land at the Muroc Air Force testing grounds.

Paul MacCready, current National Soaring Champion and CalTech graduate student, has made eight glider flights on lenticular waves including a near-record flight of 29,500 feet above sea level from the Bishop Airport. MacCready encountered large areas of steady 2,000-feet-per-minute rising air on this highest flight beneath lenticular clouds. At the conclusion of this flight, he had to fly 20 miles south of Bishop to find an area of stagnant air in which to spiral down.

Commenting on the extreme turbulence to be found near the roll cloud that forms these lenticulars, MacCready reported changes of rate-of-climb from over 2,000 feet-per-minute up to over 2,000 feet-per-minute down on either side of a 60° spiral. His airspeed fluctuated from 20 to 110 mph and his accelerometer recorded plus and minus 5 g's at speeds of only 100 mph.

Bob Symons holds "Golden C" Number 7, the highest glider rating to be issued. During a recent soaring contest at Bishop, he took off under lenticular clouds and announced his destination as Las Vegas, Nevada, 206 airline-miles distant over the wastes of Death Valley. None of the pilots familiar with the power of the lenticular clouds were particularly surprised when he landed at Las Vegas later that afternoon without incident.

The phenomenon of these standing waves is not restricted to the shadow of tall mountains. With a strong wind blowing across the Sierras, meteorologists predict that up and down currents may be felt as far as 200 miles downwind of the ranges. This series of waves tapers off in intensity much as water in a stream after it

(Continued on page 63)

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(Continued from page 61)

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Stop, Look and Relax

(Continued from page 59)

position, leave them down, and retur to the airport to have the system checke by a mechanic.

When the gear is stuck in the "up position: 1) If the gear doesn't drop o the down-wind leg, maintain your altitude 2) leave the traffic pattern and inform th control tower, if you're in radio contac of the difficulty; 3) check your norma system, the circuit breaker or hydrauli pressure, to see whether that is at fault 4) try your emergency gear system; 5) i that works, get the attention of the towe or field personnel and fly over the field after getting permission, for a visual land ing gear check to insure that the gea appears down and locked.

If there is ever any doubt about th gear being fully down and locked, ever with a visual ground check, in a tricycle gear plane make a tail low landing an hold the nose wheel off the ground a long as possible, letting it fall forward gently as you lose elevator control. Witl a conventional gear, as a precaution agains the gear folding up, make a wheel landing and touch down tentatively at first. If th gear seems firm with a solid contact, rol and then let the tail drop slowly.

In any type of landing gear emergency don't get upset, because you have as much time as your fuel supply will allow to try any methods of lowering the gear tha might be possible. Have the tower get a mechanic or field representative familia with your type of plane to give you radio suggestions on how to get the gear down

If the gear is impossible to lower by any method and fuel supply and distance give you a choice of landing fields, fly to one that can provide tower communica tions and emergency fire apparatus. Whe making a wheels-up airport landing th decision to come down on either a hard top runway or grass, if there is an alterna tive, should depend on the type of aircraft but personally I would prefer to come o the hard top to avoid snagging any par of the plane and cart-wheeling.

After the tower has signalled clearanc and you are fully committed to th approach: 1) drop your flaps; 2) turn al switches and the fuel selector valve t "off" positions; 3) bring the plane in fla in a slightly nose-high position and try t let the aft two-thirds of the plane struc ture contact the ground first; 4) when th plane finally stops moving, leave it a quickly as possible in case of possible fir from leaking fuel.

No matter what type of abnormal fligh incident a private pilot may encounter h should have no difficulties under norma weather conditions if he remembers t make his proper cockpit checks and applie his complete attention to the problem o picking a place to land.

The pilot who knows what he is doing the reason for doing it, and always has cockpit-checked mental picture of ho best to do it, should always be on top o any emergency he may experience. If h has prepared on the ground for what ma happen in the air, he'll probably wal away, under his own power, from an landing.

Big Wind Factory

(Continued from page 60)

sses over a rock. Pilots flying near these rge mountains soon learn to make these nticular currents work for them by flying much as possible in the "up" of the aves. Powerplane pilots soon "catch on" the glider pilot's technique of diving rough the downdrafts and slowing up in e updrafts to pick up some altitude for free.

When giving dual instructions in spins, r instance, Bob Symons and his partners ill seek out an area of rapidly rising air which to practice.

"Sometimes we spin *up*," grins Symons.

Passenger comfort and a sufficient oxyen supply seem to be the only restrictions h higher flights near this big wind facry. Since at 21,000 feet there is insufcient oxygen for a candle to burn, an mple supply must be carried in all high-titude research craft, either powered or otorless.

Since aeroembolism, a decompression ckness similar to the "bends," is evident altitudes above 30,000 feet, Bob ymons is now in the process of convertg a surplus Pratt-Read sailplane into a ressurized research ship. He has seen nticular clouds at 50,000 and 60,000 feet nd up currents that cause those clouds are ore than strong enough to boost a sailane to that altitude.

From the top of his record-breaking ight, Johnnie Robinson could see higher nticular clouds that looked to be another 5,000 feet above him. One U. S. Weather areau balloon disappeared into these ouds at over 40,000 feet.

Transient pilots planning flights into ese tall mountains are urged by the old-mers in the area to check their winds-oft reports before take-off. These "Pibal" eports from stations within 300 or 400 iles will show a tendency toward this ough-and-rugged condition by a strong ind shift to the west at higher levels.

"My advice to the average 'puddle mper' pilot," says Professor Brooks, "is o give mountains a wide berth in windy eather, not only for safety but also for omfort. Usually the existence of such ough air will be revealed by standing nticular clouds, but if the air is very umid, the whole sky will be covered, and it is very dry, there will be no clouds."

However, if a visiting pilot has a well-ed-together airplane, he can break the ghtplane altitude record almost anytime ere, according to Bob Symons, "We can ell a day or two in advance when these inds will be at their best," he says. "Top ight conditions usually precede a cold-ont storm as winds pick up velocity com-g across the mountains.

"If it happens to be your first trip in is area, keep checking the big hand on our plane's sensitive altimeter whenever ou strike any turbulence. If the needle inds upward, slow up and linger a while. it drops, dive with it and get out of at down-draft.

"For an unforgettable airplane ride, come p to Bishop and see us sometime. We'll ow you where to find these up-drafts! conditions are just about right, we'll even terally take you *up* for a spin."

Cross Country Is Easy

(Continued from page 55)

for pilotage, however, and no pilot should neglect his navigation in consideration of the golden age of radio homing sets in every *Cub*. With all my gear, ADF, VHF Omni-range, standard range receiver, two-way communications, voice and CW, I still keep an eye constantly on the charts.

If a pilot doesn't have much chance to go cross-country, he can still practice navigation. Instead of merely flying around on a Sunday, he could, for instance, pilot a triangular course of three legs, say of 20 minutes each, figuring wind drift, headings, ground speeds, etc. He can coordinate this with a sharp eye for landmarks around the triangle. Chances are he'll see more and get more fun out of a casual hop like this than he would otherwise.

For any kind of long cross-country, pick check points which will be about 15 minutes apart. Practice by making estimates of arrival times at these check points. These ETA's should be accurate to the half minute. Keep a log of times-enroute, the ground speed, the headings, drift, distance, etc., by writing the data right down on your chart as you go along.

Each subsequent calculation should then help you plan the rest of the flight, and you can judge your later ETA's by the accuracy of your earlier figurings.

It isn't too important which method of working out these figures you use, just as it doesn't matter which type of computer, plotter or dividers you use as tools. You can get all the fundamentals involved here out of books where they have been put down many a time. The important thing is to develop your own system and stick with it until it becomes second nature. Generally the simplest method you can work out will be best. I don't know if I should put it this way or not, but be as lazy as you can about your navigation, as long as you make sure you know where you are. The point is, don't encumber yourself with unnecessary work, logs, etc., but do your navigating chores as quickly and simple as you can—because sometime you're going to have to navigate quickly and simply so you can devote most of your attention to something else.

If you can't fly X-C in your own plane, beg, borrow or steal rides from other pilots, and make it worthwhile by pumping them for all they know about navigation.

With repeated trips over the same routes, you'll get so you know them by heart. I've been over the Los Angeles to New York route so often, I can actually fly it (with radio, that is) without a chart or even a compass—or even a log of frequencies—and do this contact or on instruments.

Naturally I have always had a full set of charts with me for reference when I didn't know the terrain by heart. Always . . . except once, that is.

And what happened that time ought to prove that a pilot can get home again as well as the horse who has memorized his milk route. On a hurry-up trip from New York to Cincinnati to Washington to New York, I had inadvertantly taken off without any charts, and also without an Airways Manual for instrument let-down proceedures. Fortunately, the experience I had gained over the route pulled me out of what could have been an embarrassing experience. As it was, I made the entire flight, including a let-down through the soup over Washington, with less information available in the plane than the road map an automobile driver needs.

Don't get me wrong, however: forgetting charts is a little like forgetting gas.

I do mean to point out, though, something that came as a surprise to me the first time I ever got into an airplane with Bill Lear, head of Learadio. This was in the fall of 1945. One night, Lear, for whom I worked later on, wanted a co-pilot between Kansas City and Grand Rapids, Mich. He latched on to me, and I watched him take-off his old *Lodestar* and "drive" it to Grand Rapids without ever taking a look at the charts in the plane.

When you begin to get to the point where, like Bill Lear, you can get in an airplane and just drive it to the next airport, you'll not only find an increasing interest in what's just beyond the horizon but your flying will become both easier and safer.

And—you'll begin to really enjoy it.

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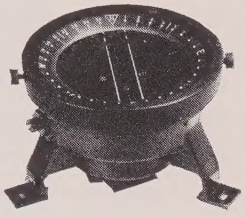

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12021 VENTURA BOULEVARD

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Dilbert

(Continued from page 37)

of order. He also neglected to obtain the latest radio navigational information. He was completely unaware that the A and N quadrants of the radio range he intended to use had been reversed two months previously. Hence, he became hopelessly lost, and badly mutilated the soft number 7 fairway of the golf course he spotted just before dark.

Dilbert was surprised to learn he was 75 miles from his destination, and was considerably irked to find there was no aviation fuel locally available. The fact that he had a date with a girl that night caused Dilbert to take his finger completely off his number. He loaded up with automobile gas, started his engine and took off. Partial power failure immediately after take-off, definitely terminated this fiasco—in the bunker near number 13 green.

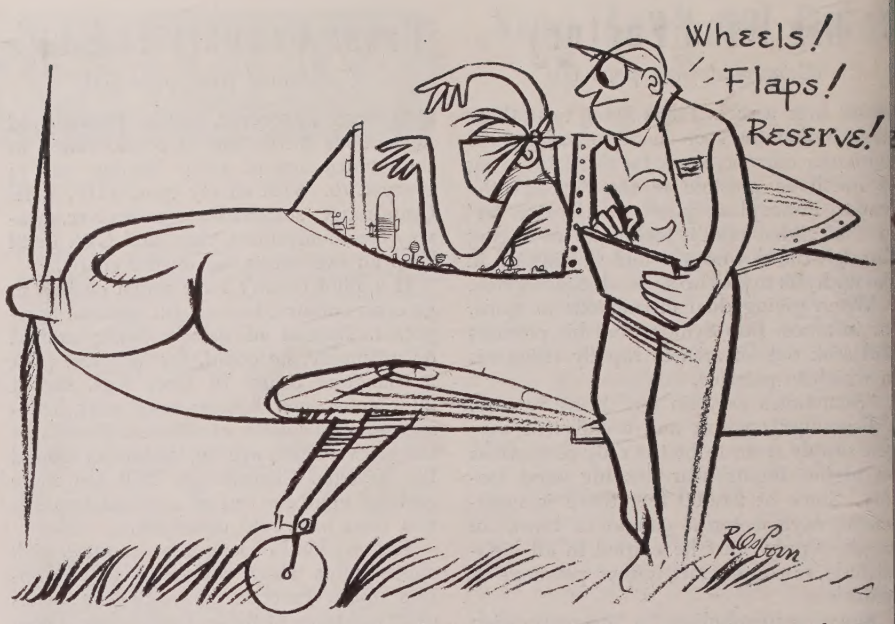
The inexcusable negligence prior to take-off which precipitated this accident, is too obvious for comment, but I'd like to nail down that low grade fuel mistake. Every engine is designed to operate on gasoline of a certain octane rating, as specified by the manufacturer. In case of emergency, engines will operate satisfactorily on a fuel of somewhat higher octane rating than that for which designed. On the other hand, the use of lower octane gas than specified will cause pre-ignition, particularly at cruising powers and above.

Any pre-ignition or detonation is injurious to an engine; in severe cases, complete engine destruction may occur in a matter of seconds at full throttle operation. Remember that and never compromise on low grade fuel!

Blindfold Check-out – Case 1. The pilot landed to disembark a passenger, then taxied back to take-off position. Shortly after he started his take-off, the landing gear collapsed.

After thorough investigation, it was determined that the pilot inadvertently unlocked the landing gear while intending to adjust his flaps.

Case 2. While checking out a pilot for night flying, the instructor made a normal landing. As the airplane slowed down, he turned the controls over to the student. The pilot then ordered flaps up, whereupon the student, in his confusion, placed the landing gear switch in the UP position – – – – – X.



The foregoing are two of many similar accidents which occur solely as the result of pilots being unfamiliar with cockpit controls. The thing which sets these two accidents apart, however, is that something was done about them. The flying school involved decided to eliminate such needless danger and damage, so they started a rigid system of blindfold cockpit check-outs. Students before solo and all instructors except the chief must now pass these checks. Another check is required any time they shift to a new model.

That's what I call intelligent action. Modern airplanes are equipped with many expensive instruments and gadgets, all put there for your benefit and safety. It shouldn't be a punishment to learn how to use them properly—it's the best accident insurance I know of.

You must become so intimate with your cockpit that you can instantly locate and operate any switch knob, lever, button or control in the dark. You don't have time to fumble in an emergency!

A Rough Ride—Once upon a time an enthusiastic student pilot took off to practice figure 8's. When his engine suddenly quit, he was forced to land in an apple orchard. Both wings were smashed, the landing gear was sheared off, and the plane came to rest draped around the bole of a tree. All this breakage, however, had absorbed the shock to such an extent that the pilot stepped out unscratched.

The sympathetic farmer who owned the orchard saddled a horse for the student who galloped some five miles back to the airport to report the crash. When the chief instructor interrupted the students excited account of the accident and the condition of the wreckage to inquire how he felt, the student replied, "Oh, sir, I'm all right now, but I'm going to be mighty sore tomorrow. This is only the second time I've ever been on a horse!"

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